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PATENTS AND THE ENGINEER — PAGE THREE

Vol. 6 September, 1953 No. 4

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Cover Story

Our cover picture this month is an artist's drawing showing how the Wells Street Plaza with the large traffic interchange will look. The Plaza will be constructed at the juncture of the Congress Street Superhighway and the Wacker Drive Extension. An estimated 90,000 vehicles will pass daily through the interchange, 20,000 of them using the curved ramps.

WSE Gets Automatic Elevator

Work started on the installation of a new fully automatic elevator at WSE Headquarters on August 27. During the installation of the elevator, access to Headquarters will be through the regular entrance and via the service elevator located a few feet to the rear of the present elevator entrance.

The elevator operator on duty will direct passengers, and there should be little difficulty during this construction period.

Your cooperation and patience is earnestly asked during the installation of this added convenience for your comfort.

September 22, General Meeting

Note: This meeting will be held on Tuesday evening at the La Salle Hotel.

Demonstrators: Westinghouse reporters Frank Briggs and Finn Dahlin.

Subject: "Energy in Action."

This Westinghouse science show features eight acts in 70 minutes of fast-moving action. It has been touring the United States for the last 28 months, demonstrating how mankind has utilized the unseen forces around him to ultimatcly develop the "Atomic Theory."

Young Engineers Forum

The fourth Forum for Young Engineers will be held by WSE starting Tuesday, October 27, and running six consecutive Tuesday or Wednesday evenings. As before, the objective of the Forum is to provide young engineers with an opportunity of expanding their knowledge of engineering in the major lines of business in the community.

The social hour will last from 5 to 6 p.m., dinner from 6 to 7, and the speaking and question period will close promptly at 9 p.m.

The registration fee for the series of six meetings is $25.00 which includes dinner. Reservations will be received by the secretary's office. Enrollment is limited to 100.

ENGINEERING CENTER

The Illinois Institute of Technology has offered a free building site to the trustees of four leading engineering societies — civil, mechanical, electrical, and mining — which now have headquarters in New York. Another site in Washington has been offered to the societies and there is a rumor that Pittsburgh civic leaders might bid as much as 2 million dollars to attract the new building.

Arguments can be made for several sites in Chicago. Other organizations of professional men discovered long ago that Chicago was the best center for their activities. The American Medical association is here and so is the American Dental association. The American Bar association is planning an extensive new building on the Midway. Many other national organizations have headquarters here for the same reasons that make Chicago the leading convention city.

Chicago will have a warm welcome for the engineers because this is a great industrial city and the capital of a great industrial empire. Chicago knows its debt to engineers.

Moreover, Chicago already has a thriving engineering center established by the Western Society of Engineers, which draws its 3,200 members from all the engineering societies. The Western Society, founded in 1869 by the railroad builders, is one of the oldest organizations of engineers. Its headquarters on Randolph st. adjoins the Crerar library, one of the great technical libraries of the world. The nucleus of a national engineering center, therefore, is already in Chicago.

The four groups with headquarters in New York might have an incentive to move to Washington if they expected the United States to become a socialist state with all the engineering jobs under the thumb of the government. Since most engineers are practical, as well as learned men, we expect them to decide to move here, and we welcome them.

—Chicago Daily Tribune

Report of actual construction presently in progress as this magazine goes to press will be found under "Work on Headquarters Is Nearing Completion" on page 15.

Patents and the Engineer

By Richard J. Schwarz

To begin this discussion, let me point out that there have been certain popular exaggerations or caricatures of inventors, especially to be found in cartoons from time to time. In one instance, the inventor is represented as a secretive individual carefully maintaining his invention concealed while he seeks patent assistance. Another of these caricatures represents the inventor as expectantly sitting in his patent attorney's office with his invention in the form of a model lovingly perched on his knees.

While, to be sure, I have actually experienced the cartoonist's favorite type of inventors mentioned, the everyday run of persons seeking patent protection are folks just like yourselves operating either as indivduals or on behalf of some organization desiring the protection afforded by the Patent Laws for the creative results of their inventive endeavors.

Before entering upon a more technical consideration of the Patent Laws, I should like to quote from the transcript of an address, phrased so well in the original that I would not wish to alter the language, by John W. Anderson, president of National Patent Council, Gary, Indiana:

"A discussion of the significance of the American Patent System, and its impelling influence upon industrial progress and cultural advancement, need not become entangled in technicalities nor involved with minor controversial questions.

"Back of all the smoke and dust thrown up from time to time by misguided assaults upon various features of our incentive economy, including that Patent System which is its indispensable catalyst, there functions inexorably a law as basic as any other of the immutable laws by which our destiny is shaped.

"Let us coin a phrase—and call it the law of propulsion by incentive.

"Perhaps our last approach to a clarification of our thinking with relation to the influence of the Patent System upon our economic vitality is through a re-examination of that propulsive law —with many manifestations of which we all are familiar.

"To illustrate, may we lift from memory an incident closely following World War I.

"British General Allenby, who had won fame through the exploits of his army in the Middle East, was lecturing with the aid of slide films.

"There appeared on his screen a desert scene of gaunt and swarthy steel-eyed gentlemen sitting quietly — well apart—each upon a bulging bundle sevelal times his size.

"General Allenby explained that these men were Syrian traders—against whom no other race or nationality could hope often to win in barter.

"He remarked that each man was sitting upon all his wordly possessions, trusted none of his neighbors, and was conscious at all times that he must be prepared to defend his wealth with his life—or face the tedious process of starting anew, with a single chip or whetstone, and trading himself back into desert affluence.

"You would have been impressed at once by the harsh economic limitations imposed upon these unfortunate men by the total lack of any organized obstruction, by law, to piracy among them.

"They had neither inducement nor opportunity to create wealth.

"Acquisition alone held their interest.

"There was no propelling incentive, no inspiration to invent anything—except perhaps a method of sleeping with one eye open.

"The contrasting picture is that of a society in which, although locks on doors and windows have not been abandoned, there are well defined, and for the most part dependable, obstructions to piracy.

"Given a substantial measure of protection against theft of the fruits of his diligence—given a sporting chance to win a competence—man becomes resourceful—and learns to cooperate with others in creative and productive enterprise.

"So long as he retains his confidence in the stability of the laws which protect his property, he grows in creative and productive strength and skill.

"As he progresses, he refines and enhances sound incentives—which gain in import from generation to generation.

"Blast away his protection from piracy, or permit it to decay, and his economic outlook contracts to that of the desert trader, whose sphere of influence is limited by the distance across which he can throw a knife.

"The American Indian had at his feet every natural resource out of which our nation has built its world supremacy.

"He exacted from those resources nothing beyond a hand-to-mouth subsistence.

"He was therefore defenseless against the slightly more advanced equipment of the invaders who dispossessed him.

"America otherwise is populated by races and nationalities migrated but yesterday from ancient foreign countries.

"Some of those countries have possessed, for untold centuries, natural resources even greater than those of our nation.

"Until goaded by inventive diligence inspired in our incentive economy, those countries had made, out of those greater resources, no marked industrial progress, throughout a history infinitely longer than the comparatively short span of years elapsed since the founding of our republic.

"Wherein lies the difference?

"From what has come in America the greater inspiration for invention and production?

"Surely, the answer must be somewhat obscure—or other nations, equally ambitious, would have found it.

"None of them did—completely.

"So it must be true that our founding fathers, but lately removed from the

(Continued on Page 4)

Richard J. Schwarz, patent lawyer and a member of the firm of Hill, Sherman, Meroni, Gross and Simpson, Chicago, presented this talk before a meeting of the Western Society of Engineers at the Society's headquarters on May 11, 1953.

(Continued from Page 3)

follies and oppressions of other lands, laid the pattern of our Constitution and our basic law more closely to the design of eternal verities than has been the pattern of life in any other country.

"To develop our superb American creative and productive muscle has required generations of traditional devotion to pursuit of rewards held out for those who best invent and manufacture things which add most to the progress and security of our people.

"Unlike the desert tradesman, our American inventor and manufacturer has been provided with protection from piracies—by means of which protection he has been able to extend his economic influence into the remotest corners of our nation—and beyond.

"Among our most inspiring laws forbidding larceny are our Trade-mark, Fair Trade, Copyright and Patent Laws.

"These laws deal broadly with creative and productive forces.

"They forbid deceptive imitation of that identifying bond of good faith between producer and consumer — which is the trade-mark.

"They forbid, in 45 of our 48 States, the defamation, against the published will of its manufacturer, of any trade-marked product by cut prices, so often employed as bait intended to expose the customer to extortionate prices on other merchandise not so well known.

"They forbid, by letters patent, the piracy of inventive achievement embodied in new and better products of greater service to our people.

"These laws all are designed to protect the physical manifestations of that creative diligence upon which a civilization must rely — for progress in peace and for protection at war.

"The importance of such anti-piratical laws, and the manner in which they make their contributions to the welfare of our people, are more difficult to understand, and to justify, than is the simpler law against piracy which says you shall not pick your neighbor's pocket.

"Our average citizen is more readily conscious of the value to him of his watch than he is of the economic import of the patented features which make it more dependable — or of the trade-mark which assures him that it is made with honest skill.

"The average citizens, Joe Doakes and Annie Oakes, who sit, and vote, on that final jury which decides all questions affecting our destiny as a nation, understand but little of the basic instincts and emotions which activate their neighbors and themselves.

"And why should they be expected to have that understanding—when so many professedly profound economists and statesmen prove so persistently their lack of it?

"To illustrate, may I recall an incident wherein a practical-minded manufacturer, through the insistence of friends, entertained at dinner an eminent economist who held him entranced with a story of study, in process for years, by that economist and a few of his academic friends?

"The study was of the history of mankind—a study in which there had been pieced together the fragments of departed civilizations to reveal, repeatedly, the romance of the struggle of man for light and life.

(Continued on Page 12)

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Its Relation to Education

The Engineer - in - Training Program

By C. S. Crouse

I have been asked to talk about the Engineer-in-Training program and the relationship of this program to engineering education. As a matter of fact this constitutes but one phase of the Registration movement which includes the effect of professional licensing on engineering curricula also. It therefore seems advisable to take a general look at the picture and to present some historical background before discussing the particular as set out in the agenda.

State licensing of any sort and this includes that of Professional Engineers is based legally on one thing and one thing only, the police powers of the State. This must never be lost sight of as all phases of the laws involved, all rules and regulations that Licensing Boards may set up are null and void unless they can be definitely tied in, in a logical way, to these police powers, in other words to the health and safety of the public.

This statement undoubtedly entails a definition or an interpretation of what can logically and legally affect the health and safety of the public. In the last analysis this will have to be determined by court decisions which quite likely will vary somewhat through the different states. But until such data is obtained, and it is not available in any amount as yet, the individual State Boards are having to make their own interpretations and distinctions.

In this regard there seem to be two distinct schools of thought; a very literal interpretation and one that is perhaps somewhat more liberal but still within the framework of the law. In the first case it might be held that only those who are involved in engineering work that can be shown to very directly affect the public would need to be licensed. In the more general and to my mind the more logical interpretation, anything an engineer may do professionally somewhere and in some way touches upon the health and safety of the public. My remarks will be predicated upon this concept.

At the present time there are engineering licensing laws in effect in all of the 48 states, in the three Territories of Hawaii, Alaska, and Puerto Rico, and in the District of Columbia. These laws are administered by legally appointed Boards and each one is entirely autonomous in its actions and must of course act within the framework of the particular state law involved.

However, most of the laws, in addition to the savings provision or so-called Grandfather's Clause, embody or have embodied two main ways in which licensing might be obtained. One of these is that registration may be given to a candidate who can show graduation from an accredited engineering curriculum and a minimum period of years, usually four, of qualifying experience satisfactory to the Board. In the other case the candidate must show a minimum of usually eight years of satisfactory qualifying experience, five of which might be while obtaining his education, and successfully pass a written or a written and oral examination.

As time went on many states, for one reason or another, amended their laws so as to eliminate registration through graduation and experience only thus requiring the successful passage of a written or written and oral examination in practically all cases before licensing would be allowed. This situation exists in about fifty per cent of the States today.

This trend has had a definite effect on engineering education entailing as it does a reconciling of viewpoint, where necessary, between the engineer who is teaching and the engineer in the field. I think that the implications are self evident but not too directly concerned with the Engineer-in-Training program.

Manifestly, although the only legal justification for licensing pertains to the health and safety of the public, nevertheless there are certain corollary effects which have had their effects on the profession. Among these has been the undoubted better understanding of and respect for the profession by the public as a whole, a better understanding of what engineering is and of what engineers are, both within and without the profession, in brief, the attainment of a truly professional status. In addition, and quite possibly even more important, there has been inculcated into the engineers themselves a better understanding of the intangibles of professional ethics and a true professional consciousness.

As the registration movement grew it became incumbent upon the various State Boards to determine which curricula and which engineering colleges would be considered as having accreditation status with that Board. I deem it self evident that the necessary investigation prior to such accreditation by the individual State Boards of all of the engineering curricula in the United States posed a monumental problem and if carried on on that basis would lead to inequities due to varying criteria.

However, lacking any other procedure, the various State Boards were left with no other alternative than to attempt the practically impossible, New York doing an excellent piece of work in this respect.

As more and more of the States passed licensing laws this procedure became more complex and more onerous and costly both to the Boards and to the schools involved and lead inevitably to the conclusion that what was needed was an engineering agency to investigate and accredit engineering curricula. As a result the Engineer's Council for Professional Development was formed with one of its major objectives the development of a fair and impartial method for the evaluation of the minimum requirements of an engineering curriculum which would make that curriculum subject to accreditation. The con-

(Continued on Page 6)

This talk by C. S. Crouse of the University of Kentucky was presented before the General Session of the American Society of Engineering Education at their Annual Meeting in Gainesville, Florida on June 25, 1953.

(Continued from Page 5)

stituent bodies of E.C.P.D. were and still are: the four founder societies, the American Institute of Chemical Engineers, the Engineering Institute of Canada, the National Council of State Boards of Engineering Examiners, and our own Society, the American Society of Engineering Education.

E.C.P.D. divided the country into zones, the constituent Societies appointed engineers from among whom the actual accreditation committees could be chosen and the work got under way. This was to all intents and purposes the first time that an attempt, on this scale at least, had been made to view engineering education nationally with a somewhat uniform set of minimum standards. In some institutions the result of the procedure was scarcely felt; in others it caused a reevaluation of objectives and in others the impact was terrific.

It can be readily seen, then, that legal licensing with its demand for accreditation which resulted in the founding or formation of E.C.P.D. and the accreditation program has had, and, I believe, will continue to have a far reaching effect on engineering education.

Again with the passage of time a new element entered the picture. The developments in the fundamental sciences of Physics and Chemistry to name but two were and are rapid and drastic. When developed into engineering techniques, these, in many instances caused the introduction of undergraduate curricula of considerable specialization. This proliferation of so called "fringe curricula" and the pressure from the schools put upon the Education Committee of E.C.P.D. for their inspection and probable accreditation presented a problem which is not yet wholly solved. To further complicate an already complicated situation various of the State Registration Boards began to look askance at some of the curricula accredited by E.C.P.D. as not being of sufficient caliber to properly train an engineer at least according to the definition of these Boards. This in turn presented a serious threat to the whole accreditation procedure with the ultimate result, if the trend continued, of throwing the procedure back into the near chaos of individual Board accreditation.

This problem has definitely worked back into the colleges; in fact they have in no small degree been responsible for its creation, and its effect upon engineering education has certainly already been felt and in my opinion will be felt even more in the future.

During the same time that proliferation of engineering curricula was taking place the developments in the fundamental sciences already spoken of were happening even more rapidly. This made it quite apparent that, if the engineer were to be properly trained in his profession, the basic science foundation of an engineering curriculum must be increased with a consequent use of more time in a fixed time curriculum for fundamentals and consequently less time for specialization. Certainly these two trends were antithetical.

The Executive Committee of E.C.P.D.

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To Stimulate Research

The Executive's Responsibility

By W. F. Rockwell, Jr.

Top management's responsibility to stimulate research and product development is directly aligned with the executive's responsibility to provide a proper return for the stockholder and the proper product for the customer. If the company expects to remain among the leaders in the pace of modern industry, it is essential to make research an integral member of the corporate team. Research is now a senior member of the firm in the majority of the well-managed industrial organizations.

There are four important areas for the executive to consider in establishing an effective research and development program:

1. Providing the Proper Climate for Research
2. Determining Areas of Desirable Research
3. Employee Participation
4. Incentives for Development of Research Thinking

The glamor in the word "research" has caused its use to go beyond a reasonable working definition. I like Boss Kettering's statement that "Research is a process of finding out what you are going to do when you can't keep on doing what you are doing now." This is industrial research when accompanied by a definite commercial objective. Unlike engineering projects, industrial research projects—although they have a commercial objective—seldom have a reasonable and clear idea as to how it is to be reached.

In my opinion, basic research—as distinguished from industrial research—can be carried on by only a few of our industrial organizations today. The average corporation must have a commercial objective in order to appropriate stockholders' funds. Therefore, we will have to let government, philanthropic and very large industrial organizations tackle the infinite and pick up the finite results when they fit our particular problems.

This paper by W. F. Rockwell, Jr., president, Rockwell Manufacturing Company, Pittsburgh, Pa., was contributed by the Management Division of The American Society of Mechanical Engineers for presentation at the Management Conference held April 15-16 in Detroit.

Providing the Proper Climate for Research

In providing the proper climate for research, management attitude establishes the basic foundation.

The first obligation is to provide good research direction. If possible it should be someone from within the organization who has a broad view of all the company's products and understands and respects the type of people assigned to research work.

The second obligation is to provide good working environment and suitable facilities. I think the laboratories should be close to the plant so frequent contact with key Sales, Production and Service personnel can be effected. However, some large corporations have found it advantageous to utilize facilities completely separated from the plant.

The third obligation is to provide an adequate security and compensation structure. Men and women dedicated to Research work should have a free mind with respect to financial matters as far as possible.

The fourth obligation is to provide the Research Director with reasonable authority to exercise initiative within his budget. He must be free to start and stop certain projects at any time without too much red tape. An atmosphere of freedom to probe into new ideas as they occur must always exist. Top management should acquaint the research director with the company's objectives and thus let him assist management in planning the company's growth through proper research.

The fifth obligation of management is to be reconciled to a slow and steady progress. A research department with a highly developed "nose for novelty" coupled with reasonable optimism is highly desirable. Management must expect setbacks along with useful results.

I'd like to insert here some suggestions from my own experience:

1. As executives, beware of plans and programs to do things you should have someone else do. Many research men will want to do everything in their own laboratories. Look carefully into testing laboratories, universities, private and public research organizations. They may be able to do a better job for you at less cost.

2. Insist on adequate records of all research and development work, particularly in connection with invention. This will help to insure the best possible patent coverage.

3. Make sure cost records are properly maintained so you know at all times how much you are spending—not on individual elements—but on research projects as a whole. When compared with annual sales volume or net worth, this provides a good index of the premium you are paying for product insurance for the future.

Since the customer is ultimately the one who benefits most from successful research, industry should attempt to show the public that research is nothing more than capital which industry is investing in the hope of progress. The proper climate for research therefore extends to advising the public of the "why" and "what" of industrial research.

The public should be made to understand that the problems of research are shared by small business as well as big business. Although small firms cannot afford large research facilities and programs, they can and do help in many ways. Industrial research—industry in general—and the consumer—will certainly be the losers if the "big-vs.-little-business" debate is permitted to hinder larger firms in their efforts to progress.

Determining Areas of Desirable Research

In determining areas of desirable research, we must consider that research, because of its character, will not fit any

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set pattern. Methods for selecting research projects, therefore, are bound to be different in various organizations. It is essential to have a well defined company policy setting down the broad aims and hopes of achievement for research. The policy should provide for a wide degree of freedom and flexibility with respect to execution of the work.

The answers to two questions should precede any industrial research project:

1. Is knowledge in the particular field sufficiently developed to give the project promise of success?

2. Is it likely that anticipated results can be profitably commercialized?

Timeliness can be an important factor in stimulating research projects and should be taken advantage of whenever possible. Research men should be constantly scanning their fields of endeavor for trends due to new technological advances in the electrical, chemical and mechanical arts which will improve their products. To recognize the trend early and act on it—or better yet to originate the trend—is good for the soul of any research man and for the morale of the entire research group.

According to C. C. Furnas in his book *Research in Industry* an industrial research project should do one or more of the following:

Produce new business, reduce cost of production, reduce operating cost to the user, increase utility of the product, increase its sales appeal, or determine technical information contributory to some other project.

Research personnel are generally endowed with attitudes and dispositions not easily demoralized by long-term, obstinate projects. However, to assure a good batting average for the laboratory and to maintain a high degree of enthusiasm at all times, the research program should include a sufficient number of projects that are reasonably certain of solution.

Another important factor in the research program is the balancing of short-, medium-, and long-term projects. The general average of research projects, according to Mr. Furnas' afore-mentioned book, are distributed as follows:

Short term	30%
Long Term	37%
Continuous	28%
Miscellaneous	5%

If the research executive is seasoned and experienced he will diversify his planning to include the proper balance of projects. Short-term projects, in general, are a reasonably sure investment, but with a low return. Medium-term projects, which may require three years, have a fairly sure return, but with a higher yield, Long-term projects of five years or more, are not so sure but in some cases with proper selection may yield a return of 10:1. The objective should be to spread the investment in research projects to provide the best average return.

It is desirable to classify new products into groups of specific interest. The Pennsylvania Salt Manufacturing Company, for example, set up the following three groups:

1. Products of interest because the company has a strong position in their distribution. These products fill needs in industries already served by the company's specialized sales groups. Ideas for such products usually originate with a salesman because of his familiarity with the industry he serves.

2. Products of interest because the company has a strong position in their manufacture. This would include those products in which the company has an advantage in either raw material sources or know-how. Ideas for this type of product come from many sources but the majority emanate from the research and development department.

3. Products in which the company would have a favorable patent position. These usually stem from the work of research and development department, but sometimes come from outside sources in the form of offers to patent rights.

Qualifications of personnel are also a recognized consideration in the selection of research projects. If, however, personnel are not already available, a large number of organizations will choose the project and then attempt to find suitable personnel for its completion.

I believe it is extremely important that projects be chosen only after adequate study and compilation of sufficient data. All proposed projects require thorough investigation as to chance of success as well as coinciding with the present or future activities and plans of the organization. There are too many hastily chosen projects which invariably result in unsatisfactory returns.

In our organization we have set up a Products Committee. This Committee maintains a continuous study of existing and proposed new products to determine exactly what we need to improve our products and to progress in our fields of endeavor. The functions of this Committee become involved with the Research Department in connection with the research study of our product lines.

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The reviews of this Committee have been helpful in steering our research program.

Employee Participation

The matter of employee participation presents a number of problems which must necessarily be solved in light of the particular organization. If a Committee is responsible for evaluating research projects, its members must be aware of the fact that good suggestions may come from individuals or groups in all levels of the organization. It is extremely important that employee suggestions—whether they involve a manufacturing process improvement or one concerned with the product—be treated with certain promptness and respect. All suggestions should be carefully evaluated before acceptance or rejection is made. For obvious reasons I believe the evaluating committee should be carefully selected and small—not to exceed three people.

Numerous companies have found it worthwhile to encourage suggestions of new product ideas from personnel not directly connected with product development. While this may be done in several ways, suggestion systems are the most common and are established for personnel below the supervisory level. Under such a system supervisory personnel are frequently reminded that one of their basic responsibilities include generation of new product ideas. The majority of employees thus have an opportunity to become involved in improving the position of their company in industry. These employees should be given a reasonable explanation when their ideas are not accepted.

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1 YOU SAVE the time and heavy expense of building forms and shoring. Pre-assembled slabs are installed by IB crane and crew, or by the contractor's own men and equipment.
2 YOU SAVE installation time because one crew and crane can install as much as 5000 square feet of Strestcrete per day.
3 YOU SAVE setting and curing time. Follow-up trades can go to work rapidly after slabs are placed, and YOU SAVE hazards of pouring concrete on the job.
4 YOU SAVE on plumbing, heating and wiring because all openings may be provided for in factory assembly of Strestcrete slabs.
5 YOU SAVE weight without sacrifice of strength, thanks to Strestcrete design and prestressed steel reinforcing rods.
6 YOU SAVE on finishing: floors may be "used as is" —or linoleum, tile, wood floors (laid on sleepers) may be applied direct on slab, without concrete topping. Ceilings look good "as is" and also have high acoustical value—may be easily painted or plastered (without use of lath and plaster) if special decoration is desired.
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CHICAGO IB FR 2-8727
IB engineers will help you with layout and design. Just phone FRanklin 2-8727 for literature and complete data.

In most companies, ideas submitted from those below the supervisory level relate to improvement in processes, or to the departmental work in which the suggestor is located. A past National Industrial Conference Board survey on suggestion systems bears this out in its disclosure that none of the awards was made for a product idea.

Most companies have found that a prime source of ideas is its top executives who are most familiar with and aware of the company's needs, resources and policies.

I think that in most cases, all the employee generally requires is to be informed of his company's need for ideas for product development and that even some very small idea which may seem self-evident to him, may be a valuable contribution not only to his company and its product but to industry in general.

Enterprising research personnel will recognize that all company departments are sources for product improvement—more especially the Sales and Service Departments whose reports will reflect improvement needs.

Sales employees who learn to recognize seemingly "little things" which will improve or further extend the usefulness of the product can be valuable in stimulating employee participation.

Since we call upon our Sales Department to exploit the findings of research, they should be provided with a ready means of advising the Research Department of field activity. Sales and Service personnel are in the best position to observe the merits and faults of the company's products as well as those of the competitors. The fact that research means a better income for the company and for the salesman should prompt the salesman to participate in the research program by way of giving ideas and making suggestions. In all our lines of endeavor the salesman is considered a recognized partner in searching for sources for new product development ideas.

Incentives for Development of Research Thinking

Many varying philosophies exist in the problem of providing incentives for development of research thinking. All incentives must tie in with opportunity which is associated with a logical com-

(Continued on Page 19)

Do a favor for a friend

Invite him to join the Society

•

Remember, the Society is as strong as its members collectively, and the more members, the stronger the Society.

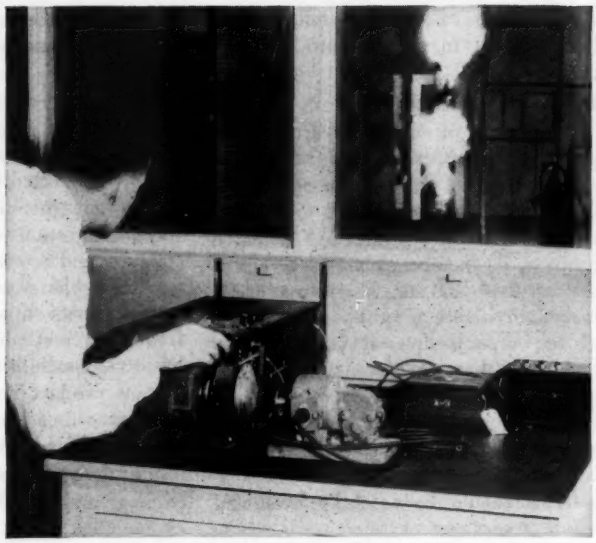
Your friend will help make WSE stronger, and at the same time make you stronger in your profession.

•

Western Society of Engineers

84 East Randolph Street

Chicago 1, Illinois



Research in L-M's short circuit laboratory—"KNOW-HOUSE." Nondestructive testing of L-M products is performed in open test areas. To the right of the fuse cutout here under test is located a reinforced steel and concrete test cell for testing to destruction. Photography, high-speed motion pictures and magnetic and cathode ray oscillograms play an important part in both types of testing.

L-M RESEARCH
is the basis for
L-M PROGRESS

Line Material makes research an important part of its program, because upon research is based the continuous development of new and better products.

This is a principle that we *practice*, as indicated by the number of L-M laboratories. There are, for example, two photometric laboratories, two high-voltage surge laboratories, a fuse laboratory, three high-potential and radio test laboratories, four mechanical and general laboratories, a short circuit laboratory, an oil circuit breaker laboratory, chemical laboratories, and others.

Here, in a creative atmosphere, are developed the many L-M "firsts" in the electrical distribution industry that help the utility companies bring you safe, economical, unfailing electric power. . . . Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

69

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Your Pet Project MAY BECOME A PRIZE PAPER

Jot down the ideas you've had for a long time . . .

Maybe they'll help you think of others . . . Maybe they'll win you one of the five, $100 prizes

Here are the rules:

Any member of the Society may compete regardless of grade of membership.

Papers shall not be highly technical in nature. A clear, concise and interesting coverage is desired rather than complex formulae or derivations. The subject discussed should be of general interest to engineers but should not be of a political or highly controversial nature.

All members of the Society who wish to submit papers in this contest should contact the Secretary as early as possible and not later than February 1, 1954, and request a copy of the rules governing the competition and an outline of the minimum requirements for acceptance of papers. These cover in detail the mechanical make-up which should be followed in preparing and submitting papers for the contest.

Papers must be submitted to the Secretary for acceptance by April 1, 1954. If the Secretary finds that they meet the minimum requirements of the contest, he will forward them to the Awards Committee for review. The papers will be identified by number only. The Secretary of the Society is the only person who will maintain the key to the authors.

If any paper does not comply with such minimum requirements, the Secretary will so advise the author and discuss with him the points which are below the minimum requirements. The papers which are accepted will be forwarded to the Awards Committee for judging not later than May 1, 1954. Papers which have not met the minimum requirements by that time cannot be considered for prizes.

Papers which are accepted will be judged on originality of presentation, editorial merit and value to the engineering profession.

The papers submitted must not have been previously published in substantially the same form. No copyrighted materials shall be used unless permission has been obtained and so indicated. All manuscripts, drawings, etc., are to become the property of the Society and cannot be published without the consent of the Society.

If the papers submitted are NOT of sufficient merit to warrant the award of any or all of the prizes, the Awards Committee reserves the right to award less than the five established prizes or to postpone the competition.

The winners will be announced and the prizes presented at the annual meeting of the Society in June, 1954.

WSE Executive Secretary will furnish you with a complete set of rules and minimum requirements on request.

Patents

(Continued from Page 4)

"After many hours of enchantment, the practical mind of the manufacturer began to press for reconciliation.

"So the manufacturer asked the economist what was the purpose—the definite objective—of his years of tedious exploration.

"The economist replied, 'We are determined to establish, once and for all, just what it is that makes man tick.'

"The manufacturer, without the slightest intent to offend, asked the economist if he could not have found a shorter cut to his answer by seeking a vaudeville show with a good trained seal act and by noting after each stunt, no matter how slight, the seal receives a hunk of fish.

"He suggested that the economist then go to backstage and ask the trainer what happens when the seal is disappointed —and gets no fish.

"Ask any trainer.

"No fish — no act!

"No incentive—no propulsion!

"Mankind finds no lasting stimulus for himself in the doing of profitless things.

"Stability of promise of reward he finds more persuasive, usually, than the size of the reward.

"He finds simple physical labor much less onerous than the sustained mental effort necessary to create a utility which did not before exist.

"Therefore, his inducements to create must offer him sound assurance of reward proportionate to the value of what he creates—or there is 'no act.'

"Thomas Jefferson knew.

"Laying the groundwork for our Patent System, he naturally did not foresee radar and the atomic bomb.

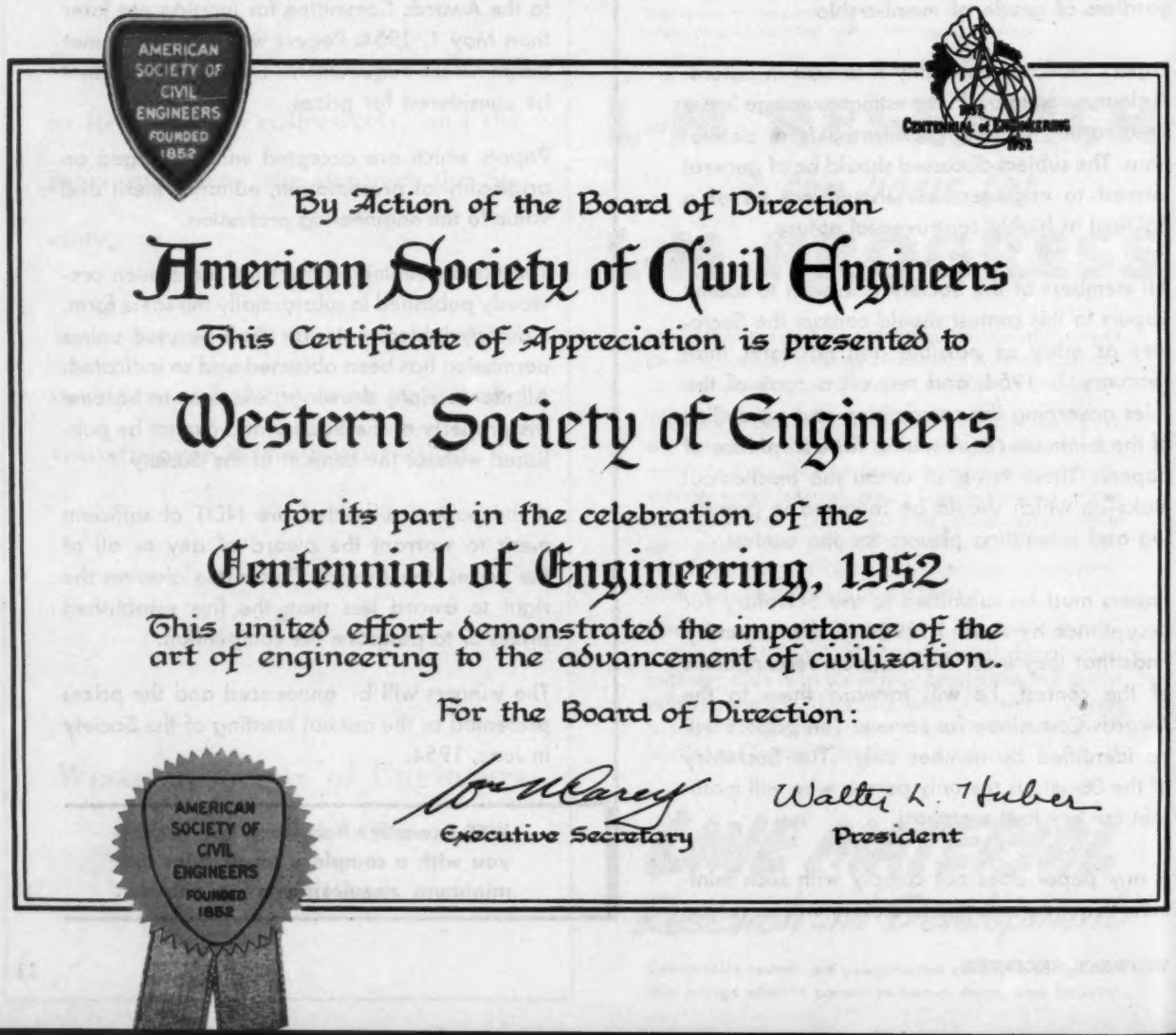
"Each, however, has been made possible by the practiced mental muscle developed through inventive diligence induced by the promise of exclusive control—for the allotted period of 17 years —of the products of that diligence.

"Those products are property.

"The patented invention should be treated most sympathetically as property—because, unlike physical property, which may be held for life, the inventor must dedicate his invention to the public at the termination of the period of his patent."

There you have an excellent analysis of the reasons for certain of our incentive-promoting laws. Now, let us examine with greater particularity our patent laws as such.

A patent in the broad sense of the term is a grant from the Government of a property right. Title in public lands


AMERICAN SOCIETY OF CIVIL ENGINEERS FOUNDED 1852
By Action of the Board of Direction
American Society of Civil Engineers
This Certificate of Appreciation is presented to
Western Society of Engineers
for its part in the celebration of the
Centennial of Engineering, 1952
This united effort demonstrated the importance of the art of engineering to the advancement of civilization.
For the Board of Direction:
Executive Secretary
President
AMERICAN SOCIETY OF CIVIL ENGINEERS FOUNDED 1852

or mining rights is granted by letters patent. However, the letters patent in which we are interested in this discussion are those covering exclusive rights in and to inventions.

We find, historically, that the King of England exercised a royal prerogative in granting patents as early as the 14th Century. Under the Statute Against Monopolies the granting of patents for inventions became a parliamentary right in England in the 16th Century.

As the American colonies developed, each exercise the legal right to grant patents for inventions. Then, following the revolutionary war, under the Articles of Confederation, each of the thirteen new States reserved to itself the right to grant patents for inventions within its territory.

However, under the Constitution of the United States, the right to grant patents was relegated to the Federal Government. Article I, Section 8, of the Constitution of the United States states, among other things: "The Congress shall have power . . . to promote the progress of science and useful arts, by securing for a limited time to authors and inventors the exclusive right to their respective writings and discoveries."

Under the authority contained in the Constitution, Congress enacted the first patent law on April 10, 1790, conferring the right to grant patents for inventions to the Secretary of State, the Secretary of War and the Attorney General. This inefficient system continued until the patent law basic to the system still in existence today was put into effect on July 4, 1836. This Statute, with various improvements from time to time, has been responsible for the progressive development of the patent system in the United States, and it has served as a model for every present day patent system in the world, to a greater or lesser extent, even including Great Britain from which this country received its early inspiration for the patent laws.

The United States Patent Office is a Bureau of the Department of Commerce and is housed in the north end portion of the Commerce Building in Washington, D. C. A Commissioner of Patents who is appointed by the President and confirmed by the Senate heads the Patent Office and has under him 71 examining divisions, each of which is headed by a Principal Examiner having under him a corps of assistant examiners of various grade, and clerical assistants.

Three kinds of patents are granted by the Patent Office namely, utility patents for a term of 17 years from the date of issuance; design patents granted for terms of 3½, 7 or 14 years, at the option of the applicant; and plant patents granted for a term of 17 years from the date of issuance. Under utility patents come inventions relating to processes, machines, articles, new chemical compositions, new electrical circuits, or combinations of these. Under design patents come inventions concerned with the external appearance or ornamental value of the article in question. Plant patents are granted for non-tuber, asexually reproduced plants. As to each kind of patent, substantially the same requirements as to invention prevail. That is, the alleged invention must be new, and useful and beyond the expected skill or knowledge of the expert mechanic or routineer in the particular art in which the invention is an advance.

Many people have the erroneous impression that before an invention may be practiced, a patent must be secured. The truth is that once an invention has been made, under the Common Law, the invention becomes public property. The only way that an inventor can secure a limited exclusive right to his invention is to take advantage of the right conferred by Statute, under the Constitution, to apply for and eventually receive a patent for his invention. Granting of a patent confers upon the inventor the *exclusive* right to manufacture, use and sell the subject matter of utility or design patents and to asexually reproduce, sell and use patented plants, for the duration of the patent grant. In other words, the inventor to whom a patent has been granted may stop others from infringing upon his patent rights.

A patent is secured by making application for patent to the United States Patent Office through the Commissioner of Patents. The application comprises a drawing, where desirable, a description of the invention, and a claim or claims defining the subject matter of the invention. Patents are granted upon the physical embodiment of the mental creation or inventive concept, and not upon ideas as such.

While the inventor himself may prepare and forward the application for patent to the Patent Office, accompanied by the proper Government fees, the solicitation of a patent and the prosecution are fairly exacting and highly developed procedures, tied into a considerable body of rules, regulations, and legal decisions, creating many technicalities which make the securing of patents a specialized activity. It is therefore cheapest in the long run to call upon expert patent counsel from the beginning in order to be assured of the best patent protection that the subject invention may warrant in view of the prior art.

In the Patent Office, the application for patent is subjected to a rigid examination of the claims of invention in the application both as to matters of form and as to invention over the prior art. By "prior art" is meant any record of what has been done in the same field of inventive endeavor before the application in question was filed in the Patent

(Continued on Page 14)

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FOR
Engineers
Architects
Patent Attorneys
Manufacturers'
Representatives

ALDIS & COMPANY Management

The Whole Loop at its Doorstep

(Continued from Page 13)

Office. By far the most comprehensive file of prior art records consists in the issued United States patents, now totaling over 2,600,000, which in the Patent Office are classified according to subject matter in search files. Each of the examining divisions has assigned to it a portion of the vast fields of technological endeavor and has search files with copies of issued patents relating to the particular art or arts assigned to that division. In addition, copies of printed foreign patents, copies of published articles, pamphlets, and other publications showing the "state of the art" are contained in such search files.

After having made the novelty examination through the prior art, the Examiner determines whether the invention, as claimed, is patentable and issues an Office Action wherein the claims are either rejected or allowed and at least after the first and, generally after the second Action the applicant is given an opportunity to respond by way of amendment and argument, either to redefine the invention or to point out wherein there is defined in the application for patent an invention over the prior art cited by the Examiner of the Patent Office.

After the application has been finally allowed by the Patent Office and the patent is issued, the inventor receives a formal patent grant from the Patent Office, a digest of the patent is published in the *Official Gazette* of the United States Patent Office, and soft copies of the patent are printed and made available from the Commissioner of Patents to the public. Most utility patents may be secured from the Commissioner of Patents at 25c each, as may also be secured plant patents, although where the drawing of the plant patent is printed in color a special showing of need for the copy may have to be shown. Design patent copies are obtainable at 10c each. *The Official Gazette of the United States Patent Office* is obtainable at a prescribed fee from the Superintendent of Documents, Washington, D. C.

Unless one is familiar with the state of the prior art in the particular field in which an invention has been made, it is often desirable to have a preliminary patentability investigation made through the files in the Patent Office, by the patent attorney, before going to the expense of having an application for patent filed. Such a preliminary search may reveal that no worthwhile patent protection may be obtainable on the particular invention in question.

Before entering upon the manufacture and sale of a new item it is desirable to have the question of possible infringement of existing, adversely owned patents resolved. This is done through the patent attorney who checks the unexpired patents in the files of the United States Patent Office to determine whether any of them have claims which would appear to be infringed by the apparatus, article or process under consideration.

Patents of invention are not renewable at the expiration of their term, except by Act of Congress. As a matter of practice, Congress does not extend any patents except in extreme hardship cases.

Most patents granted are on improvements of already patented items, or modifications of disclosures to be found in existing patents. While the owner of the improvement patent may not exploit the invention of an improvement patent without permission from the owner of a dominating unexpired patent having an earlier effective date, neither may the owner of the dominating earlier patent practice the invention of the improvement patent without permission from the owner of the improvement patent. This results in many licensing and cross-licensing arrangements. Of course, after the expiration of a patent the invention thereof is in the public domain, completing the cycle for which the patent laws were created, namely, to induce inventors to make their inventions public so that at the expiration of the patents the general public may have the free use of the inventions.

Patents granted by the United States Patent Office are effective only within the territorial limits of the United States and its possessions. If patent protection is desired in foreign countries, separate applications for patent must be filed in such foreign countries, conforming to the patent laws of the respective countries. Under the International Convention for Industrial Property, to which the United States is an adherent, priority rights from the filing date in the United States can be secured for the foreign patent, provided application is made in the foreign country within one year of filing in the United States. It should be noted, however, that in all countries except the United States and Canada, yearly taxes, generally of progressively increasing yearly amount, are payable upon patents and this must be taken into consideration as an item of expense when a decision is to be made as to filing in any foreign country.

It has, of course, in the limited time here available, been possible to hit only upon the bare highlights of this rather extensive subject of patents.

Because of the rather close tie-in, we should also consider, briefly, the question of trade marks.

Trade mark rights accrue from actual use of the trade mark in commerce, under the common law. Under our common law system of Government, supplemented by statutory law, it is not possible to reserve any rights in a trade mark; the rights in a trade mark come into existence only by actual use. However, it is highly desirable to take advantage of the statutory provisions for registering trade marks either under the state statutes where business is to be conducted solely within the confines of any particular state, or under the United States statutes where an interstate or international business is conducted under a trade mark. Under federal statutes registration of trade marks to be applied to merchandise, service marks, collective marks, and certification marks is provided for.

Applications for registration of state trade marks are addressed to the Secretary of State.

Applications for registration of a Federal trade mark are directed to the Commissioner of Patents. A federal trade mark registration is granted for 20 years and is renewable from time to time for like periods during continuance of use in commerce.

We do not have time here for any extensive discussion of trade marks, since this is an extensive enough field to warrant a separate address. If you have any further questions about trade marks, see your patent attorney who is usually also a practitioner in the field of trade marks.

We must not stop, however, without also mentioning copyrights, protection for which is provided in the Constitution as quoted hereinbefore. Copyrights are registered in books or other printed

matter after it has been published; and in music or musical compositions, works of art, plays, and motion pictures before they have been published or after they have been published.

Applications for registration of copyright are addressed to the Register of Copyrights, Washington, D. C., whose office is connected with the Library of Congress. Most patent attorneys are qualified to handle applications for registration of copyright and to give legal advice concerning copyrights.

In conclusion, your attention is called to an excellent short pamphlet entitled *Patents Make Jobs for Engineers* written by John W. Anderson, president of National Patent Council, Inc., 1434 W. 11th Avenue, Gary 40, Indiana. Copies of this pamphlet are available and may be obtained by application to the office of National Patent Council, Inc. Considerable additional information, enlargements upon information contained in the present address and some interesting commentaries by Mr. Anderson with respect to patents and the engineer are contained in the pamphlet.

The WSE Bar is open

Come in, relax, enjoy yourself.

WSE Applications

For Membership

145-52 William L. Everitt, Dean of Engineering, University of Illinois, Urbana, Ill.

146-52 Gordon C. Meyers, Assistant Engineer, Teletype Corp., 1400 W. Wrightwood Av.

147-52 Newton Turcot, Controller, Pacific Flush Tank Co., 4241 W. Ravenswood Av.

1-53 Robert F. Owens, Engineer, Production Instrument Co., 710 W. Jackson Blvd.

2-53 Gordon E. Lorenz, 4249 N. Newcastle Av.—attending University of Illinois, Chicago Undergraduate Division.

3-53 John F. Seifried, Chicago Dist. Mgr. & Member of Board of Directors, Ceco Steel Products Corp., 5601 W. 26th St., Cicero, Illinois.

4-53 Edmund A. Kolozenski, Structural Design Engr., A. J. Boynton & Co., 109 N. Wabash Ave.

5-53 James J. Becher, Sales Engineer, Greylor Company, 605 W. Washington Blvd.

6-53 Frederick G. Heuchling, Jr., Sales Engineer, Whiting Corporation, 33 S. Clark St.

7-53 Philip G. Odgers, Architect, Alvord, Burdick & Howson, 20 N. Wacker Dr.

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Work on Headquarters Is Nearing Completion

Construction work in connection with the expansion of the Society's Headquarters is moving along rapidly and it is expected that the work will be completed during the month of September.

The dining room is scheduled to reopen after Labor Day and other phases of the project will be completed shortly thereafter. The dining room, which is on the fifth floor, has been expanded to include the entire floor. There will be no hallways, but rather the elevator and stair will open directly on the dining area. Modernfold doors are being installed to permit either a banquet room seating between two and three hundred people or a dining room the size of the old dining room plus two smaller dining rooms. The small auditorium, and the conference room which is presently occupied by the Midwest office of ASME, will also be available for private dining rooms and meeting rooms.

The 6000 square feet of new space in the Kerman Building will house the following offices: Midwest office of ASME, the National office of the ASLE and the National Electronics Conference, the Engineering Societies Personnel Service (Chicago office) and the local section office of the American Institute of Architects. In addition there will be provided a meeting-room arrangement which will provide for meetings of either 200 persons, or by the means of folding doors, two meeting rooms with a seating capacity of approximately 100 each.

The central area of the Kerman Building addition will provide a modern landscaped lounge area which will serve its adjacent facilities and also act as an overflow lounge on those occasions when large parties are scheduled in the Headquarters. In this area a small card room is being provided. The central area will be furnished with modern furniture, including sofas, arm and occasional chairs, end tables, etc. The Kerman Building space will be adequately ventilated by mechanical means and will have the most modern lighting available.

The kitchen is being expanded. New ranges, broilers and other equipment are being installed in order to provide quicker service and better food.

Training Program

(Continued from Page 6)

had discussed this situation at a number of meetings and finally appointed a Committee on the Adequacy and Standards of Engineering Education with Past President Hollister as Chairman. There were three other members of this committee of which I was one, but Dean Hollister did the work. The report of this committee was rather widely publicized and I believe has had and will have some effect.

After the publication of this report, E.C.P.D. felt that the work should be continued with a broader scope and asked our Society to take over, the result being the formation of Dean Grinter's (MWSE) committee on the Evaluation of Engineering Education. This committee went right to work and is reporting at this meeting.

In what I have said so far I may appear to have wandered from my assigned subject but, if I have, it has been with purpose, as I do not believe that persons more or less unfamiliar with what has been going on specifically in the very interrelated and rather complexly intertwined developments coming from the Registration Boards, the E.C.P.D., the Engineering Colleges and from our own Society, can grasp the true significance of the problem without the overall picture.

The so called Engineer-in-Training program, and it is quite possible that a better name could be found for it, is only comparatively a few years old. In many States it is quite a lusty child; in others it is aborning and in others it is not yet conceived.

What is the program; why was it developed; and how does it justify its existence both legally and otherwise as well; and how has it or may it effect engineering education are all questions of importance and ones that I will attempt to answer briefly against the backdrop already painted.

I think everyone will acknowledge that the mere graduation from an engineering curriculum does not make an engineer. Adequate experience is some phase of engineering practice is fully as important as the acquisition of technical knowledge. In most States, if not in all, an engineering graduate cannot legally be considered for license until he has secured a minimum of four years of qualifying experience satisfactory to the Board and often it takes a considerably longer experience record than the minimum. Briefly the Board must be satisfied and the time record cannot be less than the minimum but it can be and often is greater.

This means, then, that under the most favorable conditions there is a hiatus of four years between graduation and legal recognition. This gap has been recognized for years by the Founder Societies in their qualifications for full membership.

In the past and unfortunately in many instances today the engineering colleges have had a tendency to turn their graduates loose, except for some aid in finding the initial position, and left them to sink or swim with little or no guidance in this critical period of their careers. At the same time two of the things that might help the man in this phase of his development, a true professional consciousness and a thorough concept of professional ethics, may be lacking as most undergraduate curricula do not stress these, to my mind, essential subjects in an engineer's training.

With legal licensing being a prerequisite to professional practice anywhere in the United States, one of the first and most important objectives of the young graduate is to qualify for registration as soon as possible. This means in turn that he must secure the proper kind of qualifying experience and, when that is acquired, must, in most States, pass a written examination.

These examinations are, on the average, of two days' duration, the first day being designed to ascertain the candidate's knowledge of what is usually given in an undergraduate engineering curriculum with the emphasis on fundamentals and the second day attempting to determine what he has been taught by his experience. A man upon graduation could not hope to pass the second-day examination because he would not have had the experience background, and it is becoming increasingly difficult for the man with experience alone to pass the first part because he has not had the necesary formal education.

The problem of the young engineer in the interim between graduation and the attainment of professional recognition is two-fold. First he should be integrated into the profession as rapidly as possible, and secondly, and this is probably a part of the first problem, he should be guided in such a manner as to acquire the minimum qualifications for licensing as early as is legally possible.

It has been said by some that the Engineer-in-Training program cannot be legally justified on the basis of the police powers of the State. I take exception to this viewpoint as a too narrow interpretation of the facts. I hold that anything that tends to make a man a more competent engineer directly affects or in time will affect the health and safety of the public. This is true not only during the young man's training prior to licensing but more particularly is it applicable after he has obtained registration and the legal status of a professional engineer. In my opinion the Engineer-in-Training Program has this effect.

Recognizing the situation outlined and feeling strongly that something should be done about it, several of the State Boards a number of years ago established what they called the Engineer-in-Training Program. The objectives of his program were to earmark, as it were, the young graduate for the engineering profession by in some way publicly labelling him as one working toward professional status. At the same time it was expected that this would help the individual's own morale and develop his professional integrity and competence more rapidly.

It is evident that the State Boards, as such, could do little to actually aid the man in his apprentice period but they definitely could label him so that the professional engineers with whom he might come into contact could take over.

The next question was as to how to apply this label and the solution worked out was to offer, and I want to emphasize that word "offer," the young man about to graduate or immediately after graduation the opportunity to take an examination designed to show his competency in the fundamentals of an engineering education. If the man passed this examination he was then to be given a certificate stating that he had passed such an examination and that he was qualified as an Engineer-in-Training by the particular State Board involved.

Please note that nowhere in the procedure is there any compulsion and that the certificate issued has no legal significance whatever.

The idea of the program and the procedures worked out to implement it took hold rather rapidly so that at this time many of the State Boards have inaugurated the program and others are considering it. In some States the program was authorized by legislative amendment to the existing law; in others through regulations of the Board.

The details of the plan vary somewhat as between States, which is to be expected, but in general the Engineer-in-Training examination is a written one of eight hours' duration based on the fundamentals usually taught in a four-year engineering curriculum. The cost of taking the examination varies from about three to five dollars with, in some cases, this fee being credited to the subsequent examination for licensing. As the program developed, so also did the feeling that some procedure should be worked out whereby a man might receive credit for his Engineer-in-Training status as between States. The result has been that most of the States now recognize the Engineer-in-Training examination of the other States and will give credit for it up to eight hours on the examination for professional licensing. In other words if a man has passed an Engineer-in-Training examination in one State he will be given credit for one day of the professional examination by most of the other States that have the program.

That the efforts of the State Boards along this line have the hearty support of the young engineering graduate is evidenced by the increase in numbers taking the examination. When a young man about to graduate or recently graduated from an engineering curriculum is not only willing but anxious to pay from three to five dollars for the privilege of working hard for eight hours, he must feel that what he receives, if he passes, is well worth the effort.

What has been the overall effect of the development of this program? It may be divided into two parts; the effect upon the individual and upon the profession and the production of better qualified engineers; and the effect upon engineering education. The first effect has proved to be rather definite already; the second more nebulous becoming increasingly more definitive as shown by the interest at this meeting.

I have said that the licensing Boards as such could do little more than attempt to label a man for the profession, the full effect both individually and professionally resting upon the interest and work of other agencies. These agencies, many of them, have taken up the challenge and are doing yeoman work.

E.C.P.D. was among the first to tackle the job and the work of the Monteith Committee resulting in the Monteith report was outstanding. However, the scope of the procedure as outlined in the report was such that it could not be implemented immediately. Neither the necessary funds nor the personnel were available. However, a great deal of extremely constructive work has been and is being done along the lines laid down in the report, and this not only through the efforts of E.C.P.D. alone but also with the cooperation of many other agencies and of Industry.

The results on the individual have been many not the least of which has been the easing of his integration into the social, civic and professional life of the community through the thoughtful interest taken in him by outside agencies and individuals. At the same time there has been a very definite and tangible effect as shown by the fact that, in many instances, governmental agencies and industry as well are definitely paying higher salaries for exactly the same work to those holding certificates as Engineers-in-Training than to those who do not hold such a certificate.

The effect on engineering education is evidenced in two directions; on the graduate program and on the undergraduate program.

In the former case it applies largely to those schools located in industrial centers which can offer night courses in advanced phases of engineering. Here the effort being made is to make it easy for the young graduate to continue his formal education while he at the same time is making his living. Both Industry and the Colleges in these areas are cooperating to further this objective. More can be done in this field in the way of offering well worked out extension courses either with or without College credit and through the arranging of periodic lectures and conferences given by outstanding men in various fields. The phase of the program for the up-grading of the young engineering graduate is already being emphasized in various areas, the work along this line being done in Canada being especially noteworthy.

The impact of the Engineer-in-Training program on the undergraduate curriculum has not yet been felt to any great extent with the possible exception of a few locations in which the program has been in existence for a considerable period of time. This is due, I think, to a number of reasons, not the least of which is the opinion of some deans and engineering teachers that there is not and cannot be any connection between the two. In these cases the curriculum and teaching seem to be sacrosanct and any failure on the part of the young graduate to pass his Engineer-in-Training examination is due to the examina-

(Continued on Page 18)

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(Continued from Page 17)

tion itself and not to the man's scholastic background.

I would be the last to claim that any examination is perfect; I have been teaching too long for that, and I feel strongly that written examinations are but one of a number of criteria that should be used to judge of a man's qualifications. Nevertheless, I firmly believe that when an examination such as that for an Engineer-in-Training has been well considered, has stood the test of repetition, and when students from some schools average good grades and those from others not so good, then it must mean something in so far as the undergraduate preparation of the individual taking the examination is concerned. Again, when students in a given institution average consistently good grades in some areas and consistently poor ones in others, I would consider it only the part of wisdom to enquire into preparation, method of teaching and course content in those fields in which student preparation seems to be the poorest.

No one should take an ostrich-like attitude and bury his head in the sand because sooner or later it will cause a rude awakening. Rather, I am sure, the truly constructive attitude is to examine the results of these examinations over a long enough period of time so that it may be done statistically and then, if any definite trends are shown, try to remedy any faults that may be found. This is especially true as between different colleges the graduates of which are taking the same examination and as between different departments within a given college where definite weakness may appear.

In some States where the program has been under way for a considerable period, study has shown that the graduates from certain of the institutions in those States do far better than those from other institutions and those that do better do not necessarily come from the more widely known schools. If such information could be made available, it should prove of great benefit to the administrative officers of the schools involved. No individual or school is so perfect that improvement cannot be made.

I have personally made some rough statistical appraisals of the results in my own State and I have no hesitancy in saying that some trends have been found. What they may mean is quite another question but I firmly believe that if an honest, conscientious effort to find the answer or answers is made and, if the answer appears to be unfavorable and then the same sort of effort is made to correct the situation, the impact of the Engineer-in-Training program upon undergraduate curricula and instruction may be very great indeed. If we have a yardstick, even an imperfect one, by which we can in part measure the effect of what we are trying to do, we should by all means use it even though the results may prove embarrassing. If we can find the trouble, we should be able to correct it.

It is hard to conceive of a man with four years of training getting a flat zero in the physics section or the mathematics section of an examination while the most of those taking the same examination have passed these sections creditably. Yet this has happened not once but a number of times. Should such a man be graduated with a Bachelor's degree in Engineering? Personally I doubt it. And yet this individual is probably more sinned against than sinning. Somewhere down the line someone has slipped up because such a man should never have been allowed to reach the senior year, let alone graduate.

Yes, in my opinion, there is a very definite interrelation between the Engineer-in-Training program and engineering education. It is definitely incumbent upon those of us engineers who are employed in the teaching branch of the profession to use any means at hand to improve our theory and practice, and I feel sure that a careful, intelligent study of the results of Engineers-in-Training examinations is one of these means. If this is done constructively and impartially, letting the chips fall where they may, I cannot help but feel that great good will result therefrom.

Parenthetically it should be stated that so far as the mechanics of the operation are concerned most of the State Boards are working rather closely with the faculties of the engineering colleges within their respective States in the preparation, administration, and evaluation of the Engineer-in-Training Examinations.

In what I have said I have tried to logically show how and why the Engineering-in-Training program was developed; the beneficial effect that it has had and is having upon the individual, the profession and the public; and the effect that it has had and, I believe, will increasingly have on engineering education.

It is unquestionably a controversial subject upon which I have expressed my own views only. What I have said I firmly believe. If I have been able to give you, however briefly, some background information on the subject so that you may more reasonably and logically arrive at your own conclusions, I will consider that the time and effort put into the preparation of this talk to have been well spent and that the objectives that I have had in mind while writing it will have been accomplished.

We are all working toward the same end, the production of a better product. Anything that will tend to promote this is well worth investigating. We cannot expect unanimity of opinion, nor would such be desirable. I feel that anything that will promote honest discussion and intelligent thought will constitute a forward step in the attainment of our objective.

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Executive Responsibility

(Continued from Page 9)

bination of environment, compensation and the possibilities of obtaining a future goal.

Any form of incentive is subject to failure unless proper environment exists. In other words, the place, the people, the product, and the position are all involved.

Policies of compensation must contain two elements: first, to reflect the contribution of the research worker to the general welfare of the company; and second, to adequately relieve the research worker of the pressure of ordinary personal financial matters.

Since the goals of the individuals vary with their thinking, it is important to demonstrate to the research worker that the company is not only interested in stimulating research, but also in providing for the general welfare of its employees and in building from within.

A considerable amount has been said about proper incentive payments for all of industry's employees. While there is merit in increasing productivity through incentives, those programs which work effectively are based on readily fixed physical standards. Where judgment is a main factor in determining amounts of incentives, the program becomes very difficult to administer and most likely will prove unsatisfactory. In considering incentives for any program of stimulating research thinking, the important factors seem to be those which inspire the worker. This inspiration can be brought about only if the research worker feels that his contribution to the company, industry and society is given recognition in one form or another.

The attitude of most companies for compensating individuals submitting ideas for research, seems to depend to a large degree upon the frequency and the nature of the idea. The following statement of a paper products manufacturer summarizes what we feel to be the attitude of most industrial concerns. "We have no established compensation system so far as employees are concerned except through the recognition which is bound to result from the acceptance of an idea and advancement of the employee in the company. To a large extent, improvements of products and ideas for new products are the development of employees who are paid to produce such ideas. Individuals outside the corporation are compensated on any mutually-agreed-upon basis."

Most companies feel that the research staff need not be further compensated for product ideas. This is the work they are paid to do and no incentive payment should be required. In providing the laboratory and facilities, as well as financing even unsuccessful projects, the company can readily justify this view. The incentive lies in progress within the organization as a result of producing valuable ideas in frequent numbers.

Salesmen are likewise not generally compensated for product ideas. The salesman receives increased territorial sales as his benefit from a new product.

When a formal suggestion system is used to stimulate research thinking, companies usually provide a stipulated payment for acceptable ideas. Salary adjustments or promotion may result if the suggestions are of major importance or are worthwhile and frequent.

When a company follows the practice of patenting any idea that may look good, the suggestor may be given a percentage of the sales for a limited period. This is primarily for ideas for products outside the distribution or manufacturing facility of the company.

There is a form of incentive in placing the Research Department on par with the other operating departments. The Director of Research should report to the same official, usually the President, as the other department heads. It follows that the Research Department should have membership in the high committees or be represented on the board. This provides research with first-line information on top decisions based on exchange of views with Sales, Management and Production.

Properly encouraged active membership in technical societies and trade associations is definitely an incentive for the development of research thinking. Industry has the use of many such agencies of which the wise research director makes full use. Technical societies and trade associations set up standards and disseminate information on latest developments in their particular fields. At times they assist in, or actually perform, research. These functions supply small business with much information which would not otherwise be available to them.

Our Patent System is another agency which provides stimulation of research thinking. Many companies are now offering a payment of a fee to their inventors when an application is made and when a patent is issued.

Our Patent System also avoids much duplication of effort among research laboratories since it provides a means for protecting all research findings rather than trying to keep them as company secrets. This would be the case if it were not for our patent structure.

The public education program or clinics of universities and colleges are also a great help in publicizing and stimulating the importance of research. These clinics are valuable to research workers, small industry and the general public for comparing notes and opinions on much knowledge that larger companies have spent years of time and effort in developing.

In conclusion it can be safely said that industrial research is certainly now a well established member of most corporate families—and is not merely a trend or an attempt to be fashionable as some have termed it. The much referred to "Yankee inventiveness" or toolroom cut-and-try development is evidently a thing of the past.

The contribution of technological advancement by industrial research in the past twenty years clearly shows its profit making potential. Certain advancements will always come about without the necessity of a formal program; however, accomplishment through a planned program is more efficient and more prolific than through an informal one. This is easy to say and do in prosperous times when the industrial trend is on the rise. The forward looking executive will, however, firmly establish his industrial research program to continue even when business dips.

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Argonne Builds Another Computer

Construction and operation of the World's fastest high-speed general-purpose digital computer (electronic brain) was announced July 30 by Argonne National Laboratory.

The computer, known as the ORACLE (Oak Ridge Automatic Computer, Logical Engine), was designed and constructed at Argonne by a staff of engineers from Argonne and Oak Ridge National Laboratory under the direction of J. C. Chu. It will be installed at Oak Ridge early this fall where it will be used by the Oak Ridge National Laboratory mathematical panel under the direction of Dr. A. S. Householder.

In 1950 Argonne, which was then building its computer, the AVIDAC, agreed to design and construct the ORACLE for Oak Ridge. In logical design, the ORACLE is a modification of the AVIDAC which, in turn, is a modification of the computer at the Institute for Advanced Studies at Princeton. However, the engineering design has been greatly changed for the purpose of improving reliability, ease of maintenance and to increase the speed of operation.

The new computer, which was built at a cost of $350,000 contains three features which make it superior to other computing devices. First, its internal memory system has the greatest capacity of any high-speed general-purpose computer ever built. It can receive, retain, and process as many as 2,048 twelve-digit decimal numbers which is twice that handled by computers of this type and about eight times that of most of the earlier machines. Second, the ORACLE is provided with a remotely-controlled auxliary memory system (magnetic tape) which provides for the memorizing or storing of four million words. (One word is equivalent to one 12-digit decimal number.) This is the largest memory system ever contemplated for a computer. Third, the ORACLE is the fastest of the general-purpose computers. It can multiply 12-digit numbers such as 999,999,999,999 by 999,999,999,999 in less than 1/2000 of a second. The addition of two 12-digit decimal numbers takes place in about 5/1,000,000 of a second. A difficult mathematical problem which would take about 5 to 6 years for two mathematicians to solve with the use of desk-type electric calculators could be completed in about 20 to 30 minutes by the ORACLE.

Basically, the computer consists of four parts: (1) an input-output section where the problems are fed into the machine and where the answers come out; (2) a control section which tells other parts of the machine what to do, how to do it, and in what order the work shall be done; (3) an arithmetic unit which performs additions, subtractions, multiplications, divisions, and other arithmetical and logical operations; and (4) the memory units.

In operation, a message or problem is prepared on a modified teletype instrument and is fed into the ORACLE's internal memory unit. Information and data of immediate need in the solution of the problem are retained in the internal memory unit while other data are stored in the auxiliary memory unit and automatically called for as needed. The control section regulates the flow of information from the memory units to the arithmetic unit and back again as is required by the course of the computation. It also sends the answer out to a paper tape at the output end of the arithmetic unit. The tape is then "translated" into numbers and characters by a teletype page printer.

The ORACLE is a complex instrument. It contains 3,500 electronic tubes, about 20,000 resistors, and about seven miles of electrical wire. It is, however, exceedingly compact. The arithmetic unit has the following dimensions: 12 ft. long, 2½ ft. wide, and 7 ft. high and the internal memory unit is only slightly larger.

The internal memory unit consists principally of eighty 3-inch cathode ray tubes (similar to television picture tubes) which can store a total of 2,048 twelve-digit decimal numbers. The problem and related information is stored on the inside face of the tube in the form of electric charges. The presence of these electric charges is detected by an amplifier and this signal is either transferred to the arithmetic unit or is used to regenerate the information in the memory. This form of memory requires periodic refreshing, and the refreshing takes place automatically about 65 times per second.

Design of the internal memory unit represents a departure from the design of Argonne's AVIDAC and from that of most computers. ORACLE's internal memory consists of 40 separate plug-in units, each containing two 3-inch cathode ray tubes and 22 small electronic tubes which are used in the amplifying and switching circuits. By the use of packaged units, repairs to the memory unit are accomplished with a minimum of shut-down time. To further speed the replacement of a defective unit, 3 extra memory units are connected to the system and thereby kept in a "warmed-up" condition.

Electronics Conference to Convene on Sept. 28

The ninth annual National Electronics Conference will convene September 28, 29 and 30, 1953 at the Hotel Sherman, Chicago.

The technical program offers 99 papers covering a broad field of Electronic Research, Development and Industrial Application and is supplemented by over 140 exhibits by manufacturers foremost in the electronics field.

On the social side, the Conference sponsors three luncheons featuring prominent speakers, an informal evening banquet, and a full three day social program for the ladies. Two evenings are available for viewing the exhibits or visiting any of the famous entertainment spots only a few steps from the Hotel Sherman.

The conference is sponsored by the American Institute of Electrical Engineers, Illinois Institute of Technology, Institute of Radio Engineers, Northwestern University, University of Illinois with Purdue University, University of Wisconsin, the Radio-Television Manufacturers Association and the Society of Motion Picture and Television Engineers participating.

The president of this year's conference is Dr. J. D. Ryder of the University of Illinois.

Advance registration may be made by writing to National Electronics Conference, Inc., Karl Kramer, Executive Secretary, 852 East 83rd Street, Chicago 19, Illinois.

On Training—
Letters from Leaders

In the last issue of Midwest Engineer we published another of about thirty letters received from leaders of Chicago-area firms concerning shortcomings noted in the engineers in their employ. Many of the letters also suggested what the engineers should do to correct their deficiencies.

Significantly, the engineer's technical training is generally considered adequate. In the broad area of Human Relations, however, engineers seem often to be "under achievers," according to the viewpoint of the industrial leaders as reflected in their letters.

We are printing another of these letters in this issue, as we shall do in future issues. Although the letters may be of greatest value to the younger engineers, we hope that all of the engineers who read them will benefit.

Here, then, is the next letter:

Dear Mr. Becker:

When I received your letter of August 31 in regard to the educational needs of your members, I referred it to our Chief Engineer, Mr. ..... I am quoting his reply as follows:

"The letter from the Western Society of Mechanical Engineers is very pertinent to the problem we have had for many years, that is to develop engineers for supervisory work.

The qualities they list, personality, cultural development and commercial sense, and in addition technical knowledge, are the combinations of qualities we have been searching for in our engineers. In addition, there is that indefinable quality of leadership that gains the respect of the men they supervise, that inspires them to do more and better work.

In general, technical ability is present or can be gained by experience. Our attempts to develop personality or leadership, if not inherent in the man, have not been very successful. It is my belief that any program attempted to better equip engineers for supervisory responsibilities should be limited to selected men.

Assuming the men selected have the basic requirements such as personality and leadership quality, I believe the proposed educational program should be focused on cultural development and broadening of the commercial viewpoint and leadership improvement.

In general, I believe we would be interested in the suggested program but naturally we would have to have more information as to details in order to determine how it would fit into our particular situation."

Gunnison Alters Name

Gunnison Homes, Inc., nationally-known housing subsidiary of United States Steel Corporation, has changed its name to United States Steel Homes, Inc., it was announced August 4 by Gen. John J. O'Brien, president of the subsidiary company.

"Within a few weeks, our company, for the first time, will begin production of factory-made steel buildings at its new plant in Harrisburg, Pa.," Gen. O'Brien said. "Therefore, it is our belief that the new name of United States Steel Homes not only will be more appropriate but also will provide closer identification with the parent corporation."

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New Blasting Devise Called Safer and Better by International Nickel

Igniter cord, a new device safer and more efficient than older methods, has been adopted by The International Nickel Company of Canada, Limited, for use in drift driving at its mines in the Sudbury District of Ontario. In use now after exhaustive tests at Inco's mines, igniter cord requires a blaster to remain at the loaded face only long enough to light a single fuse, instead of having to light the fuse in each drill hole separately. Igniter cord has been found to be more satisfactory than electricity for detonating the holes.

The chief aim in International Nickel's development of igniter cord was the safety advantage gained through having to light only one fuse. This is particularly desirable where the path of retreat from the working place is difficult and time-consuming, or where staging has to be removed. With the use of igniter cord it is possible to delay the actual lighting of the round for a considerable time by employing a fuse of sufficient length as a "master fuse" so that the igniter cord circuit is not lit until everyone has reached a place of safety.

All fuses in a loaded face are connected to the igniter cord in the order in which it is desired to detonate the holes. When lit, the igniter cord burns along its length with an external flame at the zone of burning. The flame, usually short and quite hot, in turn lights the safety fuses in rotation. The type of cord used at the Inco mines burns at approximately 20 seconds per foot, and is designed to meet the conditions encountered in development rounds or locations where the holes are drilled relatively close together. Another type of cord with a burning speed of about eight to 10 seconds per foot is designed for use in conjunction with safety fuse in achieving rotation firing on stope breasts where the holes may be collared from two to four feet apart.

The safety fuse is attached to the igniter cord by means of a connector in the form of a shell with a composite ignition charge consolidated under pressure. A slot at one end of the connector holds the igniter cord securely.

Value Analysis Lowers Plant Costs

On the average, one fourth of manufacturing cost is unnecessary. It continues because today's thinking is based upon yesterday's knowledge. Value Analysis, a plant-wide creative cost reduction program under purchasing leadership, can cope with these limitations. This program was presented by L. D. Miles, organizer and manager of the Value Analysis Unit, General Electric Company, at the semi-annual meeting of the American Society of Mechanical Engineers in Los Angeles on June 30.

Value Analysis is a creative study of every item of cost in every part or material considering other material, newer processes, abilities of specialized suppliers and possibilities for engineering re-evaluation. It focuses engineering, manufacturing and purchasing attention on one objective—the same performance for lower cost. It promotes no suggestions which would lower quality. It is not a substitute for the engineering and manufacturing cost reduction work which is carried on by every company. It is a supplement.

Value is established by comparison. The relationship of the function or service performed by any part or material to the lowest dependable cost for obtaining that function or service establishes value.

Purchasing must guarantee to management that each dollar of cost buys a real function. It must improve the operation or the appearance of the product.

Purchasing must know that every dollar it spends plant-wide is "working." For example, we saw yards of asbestos paper rolled out along the floor under a paint conveyor catching paint drippings. "Why an expensive asbestos paper for so simple a function?" "To meet the fire safety code!" Probably yesterday's thinking again!—To evaluate asbestos for catching paint drippings starts a broad inquiry to makers of special papers. Sure enough, a non-burning paper is obtainable.

The door of the Purchasing Department is open to all peoples who may have a process or material or part or service which will do the same job at lower cost, thereby setting the value line for other items.

Value Analysis consists of:

1. Buyers and specialists trained in value techniques and human relations.

2. Carefully studied techniques for operating in the human relations climate and for constantly improving it.

3. The necessary operating information. This includes—specific knowledge, specialist information, idea sheets, new products and processes information.

The value analysis trained buyer studies similar products or services or materials. He studies the use to which each feature of these items is put and he determines whether functional performance can be purchased at lower cost by eliminating, substituting, simplifying or grouping.

Value Analysis engineer specialists must work with all of the facts. They require drawings, specifications, planning cards and all costs. In discussion with the responsible engineer, they familiarize themselves in general with the basic operation and problems of the product. After a similar study of manufacturing operations, their intense program of seeking out, adapting, evaluating, and applying follows.

The Value Analysis Ten Tests for Value of each par or material or service studied ask:

1. Does its use contribute Value?

2. Is its cost proportionate to its usefulness?

3. Does it need all of its features?

4. Is there anything better for the intended use?

5. Can a usable part be made by a lower cost method?

6. Can a standard product be found which will be usable?

7. Is it made on proper tooling—considering quantities used?

8. Do material, reasonable labor, overhead and profit total its cost?

9. Will another dependable supplier provide it for less?

10. Is anyone buying it for less?

When buyers have learned "function" or "value" buying, when Value Analysis specialists are trained in Value techniques, when the proper human relations climate has been created, and when the necessary specific information is provided to each, then the job of plant-wide creative cost reduction under purchasing leadership is well on its way.

Naval Society Policy Permits Data Release

The Society of Naval Architects and Marine Engineers has announced a new policy of making available to non-members much of the data developed by its important Technical and Research Committees. Heretofore the published research material has been circulated principally among the members of the Society. Feeling that the science of ship design and building will be advanced more rapidly if this technical data is made available to all in the marine industry, the Society is now offering all of its books and technical bulletins to the entire trade, not only in the United States but also abroad.

There has been a considerable demand in the past for the publications of the Society, particularly its books which have already gone through several editions. These books, compiled by members, have been very popular and relate principally to the science of naval architecture and marine engineering.

The bulletins prepared by the Technical and Research Committees of the Society are a comparatively new venture. They are technical in scope and reflect the work of leading engineers in the fields of naval architecture and marine engineering in the United States.

The technical bulletins, model resistance data sheets and books which are now being made available to all in the marine industry may be obtained from the Secretary's office at 29 West 39th Street, New York 18, N. Y.

Underwood Appointed

P. J. Underwood has been appointed the new executive secretary of the Society of Plastics Engineers.

Underwood received his Bachelor of Arts degree in Economics at Hamilton College in 1949 and attended Georgetown Law School. He is a member of the Delta Theta Phi Legal Fraternity.

Underwood was a Commodity-Industry Analyst in the Miscellaneous Metals and Minerals Division of the Department of Commerce and prior to his present appointment has been in organizational and public relations work serving as Field Representative and Executive Assistant in trade associations in Washington, D. C.

Elect Grinter President of A.S.E.E.

L. E. Grinter, MWSE, dean of the Graduate School, University of Florida in Gainesville, has just been elected president of the American Society of Engineering Education.

Dr. Grinter is a former member of the Western Society's Board of Direction, and a former chairman of the Society's Civic Committee.

He received his bachelor's degree in Civil Engineering from the University

Dr. Grinter

of Kansas, and his master's and doctor's degrees from the University of Illinois.

Before going to Texas A & M College as an assistant professor of Structural Engineering in 1928, Dr. Grinter worked as an engineer and designer for Standard Oil Company of Indiana. He became a full professor at Texas A & M in 1929. Coming back to Illinois in 1937, he became director of Civil Engineering and dean of the Graduate Division of the Armour Institute of Technology in Chicago. In 1939 he became vice president and dean of the Graduate Division of Armour, and held this same position at the Illinois Institute of Technology from 1940 to 1946 after the Armour and Lewis Institutes consolidated.

From 1946 until 1952, after relinquishing his other activities at Illinois Tech, Dr. Grinter became research professor of Civil Engineering and Mechanics. He went to the University of Florida as dean of the Graduate School in 1952.

Dr. Grinter has written several books on engineering, and a great number of papers.

He belongs to a number of engineering societies, and has been unusually active in engineering and education.

Time-Motion Studies, Clinic, Slated for Nov. 4

The Seventeenth Annual Time and Motion Study and Management Clinic sponsored by the Industrial Management Society will be held on November 4-5-6, 1953, at the Sheraton Hotel, Chicago. According to general chairman Ralph H. Landes, Western Electric Company, more than 2000 industrial engineers, works managers, plant superintendents, and supervisors are expected to attend the technical sessions.

Topflight industrial leaders from all over the U. S. will discuss the latest developments in the fields of time study, motion economy, job evaluation, methods, plant layout, materials handling, and human relations.

Feature of the event will be the Annual Methods Improvement Contest, with awards to companies and colleges for outstanding advances in industrial engineering techniques and applications.

Education Committee Issues Yearly Report

The Education Committee of the Western Society of Engineers has completed another successful year of activity under the capable chairmanship of Mr. C. A. Blessing and we are anxiously looking forward to this year's program. We regret that the man who was the "spark plug" in developing our Educational Program to its present level will not be here to guide us this year. Many of you already know that Charley Blessing accepted the position as Director of Planning for the city of Detroit and moved there last spring. We of the Education Committee wish him continued success in his new undertaking, but we shall miss his energetic leadership here at the Western Society of Engineers.

It was largely through his personal efforts that we have built up our present curriculum of evening courses which are tailored directly to the needs of the professional engineer. Our program includes courses in Human Relations, Conference Leading, Executive Training and Rapid Reading. The fact that last year we enrolled over 500 engineers in these courses plus the enthusiastic reports received seemed to indicate that we are satisfying a definite need of our members. This year, due to the additional space available in the headquarters and also the reputation of our courses, we look for an even greater enrollment.

This year, as in the past, we are working in conjunction with the General Education Committee. Mr. Fucik, chairman, Mr. Elliott, Dr. Whitehead, Mr. Varenhorst, Mr. Kesios, Mr. Snyder, Dr. Soria and Mr. Parmer have also contributed much time and effort to the development and organization of our activities for which we are very grateful. Our 1953 brochure will soon be mailed to you and inasmuch as we expect another overflow enrollment, we suggest that you mail in the form promptly.

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Societies Recommend Certification

Use of the facilities of the American Society of Civil Engineers and the Engineers' Joint Council to obtain desired certification of sanitary engineers has been recommended by the Joint Committee for Advancement of Sanitary Engineering, a grouping of representatives of five major organizations in the field. After detailed study of numerous proposals for enhancing the recognition of sanitary engineers, action was taken, during a July 27-28 meeting of the committee in Washington, recommending steps to be taken in establishment of a Specialty Board.

As proposed, a certification board of five members, as recommended by the joint committee, will be appointed by the Board of Direction of ASCE. Ultimately, both the joint committee and the specialty board are proposed to become administrative functions of Engineers Joint Council, because of the cooperative interest of several professional organizations in the program. Functions of the board members will be augmented by appointed consultants.

Upon application by individuals and satisfactory evidence of professional ability in the field of sanitary engineering, certificates will be issued. Those so certified will be designated members of an American Academy of Sanitary Engineers. It is not proposed that this academy become merely an organization to collect dues, hold meetings, issue publications or in other manner duplicate such activities now conducted by existing organizations. The sole purpose proposed for the academy is recognition of those certified by the specialty board. Modest expense for operation of the board, issuing of certificates and maintenance of a roster will be defrayed by collection of a fee for certification.

Before this proposal can become a reality, endorsement of the ASCE Sanitary Engineering Division and approval by the ASCE Board of Direction are needed. Before EJC can administer the program, adoption of the proposal by that Council is required.

Represented on the joint committee which produced this proposal are:

American Public Health Association, American Society of Civil Engineers, American Society for Engineering Education, American Water Works Association and Federation of Sewage and Industrial Wastes Association.

Representatives assembled at this Washington meeting confirmed Ernest Boyce of Ann Arbor, Michigan, as chairman of the joint committee and Alfred Wieters of Washington, D. C., as secretary.

As a definition of sanitary engineering, the joint committee adopted the statement prepared by the committee on Sanitary Engineering of the National Research Committee in October, 1943.

Crerar Library
News and Notes

A recent important action by the Board of Directors of the Library was the establishment of the *Life Members Fund*. Life memberships have been a part of the Library's membership program since its beginning, such memberships resulting from single gifts of $500 or five annual gifts of $100 each. Gifts from this source having already reached more than $5,000, the Life Membership Fund was established as a special endowment fund, income from which will be devoted to the following purposes: (1) dissemination of information about the Library and its collections and services, (2) purchase of important items for the collections which cannot be acquired within the limits of the Library's regular budget, and (3) care and preservation of some of the great treasures already in the Library's collections. Present Life Members of the Library are: Dr. Horce E. Turner, Mr. George R. Jones, Dr. Morris Fishbein and Mr. Edward L. Ryerson. Eight other individuals are making $100 annual contributions applied toward life memberships.

* * *

Forty volumes of recent Russian scientific periodicals have just been given to the Library by the Standard Oil Company of Indiana through the courtesy of Dr. Tolpin. The 16 periodical titles include the Russian journals *Peat Industry, Automobile, Coal, Timber Industry, Power Bulletin of Mining and Oil Industry, Bulletin of Engineering and Technology* and *Welding Journal*. All but two of the titles are new to the Library's collections. Although the language barrier limits the amount of use of these Russian periodicals, they nevertheless form a crucial part of the Library's collections as a resource for scientific and technical information.

* * *

William S. Budington, Associate Librarian, attended the Institute on Current Problems of Science Literature Service which was held at Columbia University during the week of August 17. Mr. Ellis Mount, Research Associate in Research Information Service, has been invited to read a paper on "Abstracting and Indexing Sources for the Literature of Metals and Metal Fabrication" at the National Metal Congress to be held in Cleveland in October. Ella M. Salmonsen, Chief, Medical Department, will set up an exhibit on the history of pediatrics at the meeting of the American Academy of Pediatrics to be held in Miami, Florida, in October.

Hydraulics Conference Will be Held in Chicago

Illinois Institute of Technology will be host to the ninth National Conference on Industrial Hydraulics October 8 and 9 at the Hotel Sheraton in Chicago.

Conference director will be O. E. Teichmann, assistant chairman of the heat-power department at Armour Research Foundation of Illinois Tech. Carl E. Schmitz, vice president of the Crane Packing company, will be associate director.

Societies that help Illinois Tech stage the conference each year include:

The Illinois section of the American Society of Civil Engineers, Chicago section of the American Society of Mechanical Engineers, Chicago section of the Society of Automotive Engineers, Western Society of Engineers, American Society of Lubrication Engineers, Chicago section of the American Institute of Chemical Engineers, Chicago section of the Institute of Aeronautical Science, American Society of Agricultural Engineers, Chicago chapter of the Illinois Society of Professional Engineers, and the Chicago chapter of the American Society of Tool Engineers.

Outside Training Recommended

The advantages of industrial relations training outside the company, especially for small organizations, were hailed June 30 in Los Angeles by Clifford H. Shumaker, director of The Institute of Management at Southern Methodist University, Dallas, speaking at the semi-annual meeting of The American Society of Mechanical Engineers.

Emphasizing that the key man in any organization, from management's viewpoint, is the line supervisor, he pointed out that it is the exception to find one individual who combines the knowledge of production and job skills with the ability to manage people. Supervisory training given on a university campus has advantages over a company-operated program because it usually costs much less, even including transportation and subsistence. The program may be used or terminated at will without interfering with company plans and departments. Outside specialists in each subject encourage an over-all view of business, and members from several companies in one group have a chance to exchange information. Getting the trainee into classroom surroundings is more conducive to training, Mr. Shumaker said.

At the Institute of Management, instruction is given by the regular university faculty and specialists from industry. The company selects the men to be sent to class. Besides coming from different types of companies the trainee's educational background may range from third grade to doctor of philosophy.

To solve the problem of instructing such a heterogenous group, classes are conducted on a strictly informal basis. Men are known by their first names, and jobs and titles are forgotten. Simple language is used. The advantage of mixed groups lies in the fact that each level of supervision represented gains an appreciation of the job and its problems. Mutual understanding develops out of the exchanged thoughts and ideas in such groups.

The Human Relations Institute is given in a period of four and one-half days covering 27 hours. Emphasis is on the foreman's responsibility rather than techniques. Sessions on understanding people develop the ideas that all human beings seek personal recognition, the worker wants to be treated as an end in himself, and the worker wants to feel that he is a real part of the total organization. Time is spent in analyzing the meaning of each major point and in stressing the manner in which the supervisor can satisfy these basic worker desires within accepted limits.

The techniques of maintaining communications and the importance of detecting and correcting faults are stressed. Emphasis is placed on the need for workers to be able to communicate freely and effectively with their supervisor.

The worker-supervisor relationship is discussed from both the union and non-union points of view. Personnel selection and evaluation are discussed strictly from the viewpoint of the supervisor and not the personnel department.

The Institute of Management has carried on a successful program for the past five years, serving 236 companies which sent 2,468 individuals. The continued participation over a period of several years and the inclusion of all supervisory personnel by both large and small companies seems to prove the value of this type of training, Shumaker said, with the comment, "It is not possible to say that personal improvement has been so extensive as to be measurable in terms of avoiding labor troubles which would otherwise exist, or in reducing labor turnover, or in the many other ways which reflect good or bad industrial relations. But it is evident from the participation and reported individual progress that here is a means of conveying valuable information to a supervisor who, in turn, is receptive to it and who, in the great majority of instances, will put it to good use."

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Obituaries

The Western Society of Engineers has recently been notified of the following deaths.

Fred Farrell, who has been a manufacturer's representative in Cedar Rapids, Iowa, died Feb. 9, 1953. Mr. Farrell had originally joined the Western Society in 1925.

Frederick E. Turneaure, dean emeritus of Engineering, University of Wisconsin, died March 31, 1951. Dean Turneaure, who joined the Society in 1897, became a life member in 1938. He served as second vice president of the Society during the 1903-04 year, and received the Octave Chanute Medal in 1907 for a paper on civil engineering.

The Society has learned of the death of **William H. Knehans.** Mr. Knehans joined in 1920 and became a life member in 1950. The Society has been unable to learn the date of Mr. Knehans' death.

Edwin H. Smythe, a consulting engineer and expert in patent causes with offices in the Monadnock building for many years, died July 12, 1953. Mr. Smythe joined the Society in 1907. He had been a life member since 1937. Mr. Smythe's home had been at 2741 Harrison street in Evanston.

Edwin Ahlskog, a life member since 1941, died on July 14, 1953. Mr. Ahlskog, a consulting engineer who had lived in Kansas City, Mo. for many years, joined the Western Society in 1910.

WSE Personals

John T. Robinson has been named director of Project Development for Francis H. Bulot, Consulting Engineers, Inc., it was announced today by **Francis H. Bulot,** MWSE, president.

The firm maintains offices in Pasadena, Los Angeles and Costa Mesa, California.

Robinson, a resident of Glendale, is a graduate of the University of Illinois School of Civil Engineering. He has practiced engineering for 15 years in the fields of industrial waste disposal; water and sewage system design; treatment plant design, construction and operation and municipal management surveys.

The Bulot organization which specializes in these fields, has been identified with many of the larger projects in this category in Southern California.

E. DeZwarte, MWSE, formerly an estimator with Thorgersen and Ericksen Co., announces that his activities will now be with the new firm, DeZwarte Construction Co., with offices at 201 N. Wells st. The phone is RA 6-0312.

Charles B. Burdick, MWSE, and a past president of the Society, **Louis R. Howson,** MWSE, and **Donald H. Maxwell,** MWSE, partners in the firm of Alvord, Burdick & Howson, engineers for water works, water purification, drainage, appraisals, power generation, etc., take pleasure in announcing that the following men who have been associated with them for many years have been admitted to partnership.

The men are: **Russell E. Crawford,** MWSE; Edward E. Erickson; **Arthur W. Howson,** MWSE and a former trustee of the Society; **Reed I. MacDonald,** MWSE; **Philip G. Odgers,** who has applied for membership to the Society; and George J. Rettig.

The firm is located at 20 N. Wacker drive.

Robert W. Dittus, it has been announced, has been appointed sales manager of the Electrical Engineers Equipment Co. of Melrose Park, Ill. Dittus is a graduate engineer. He attended the Illinois Institute of Technology in Chicago. For a number of years he had charge of Electrical Engineers' substation design department. He supervised the design and acted in a consulting capacity on the erection of many outdoor substations for utilities and industrials.

Frank W. Edwards, MWSE, is in charge of the Stanley Engineering Company office which opened August 1, in Room 409-10 of the Utilities Building, 327 South LaSalle street, Chicago 4.

Edwards, since 1948, has been director of Civil Engineering at the Illinois Institute of Technology. While on temporary leave, he was general manager of the Centennial of Engineering held in Chicago in 1952. Prior to his association with the Illinois Institute of Technology, his experience included teaching at Carnegie Institute of Technology and at Pennsylvania State College and a number of years with the United States Engineers with major responsibility on design of civilian and military projects. He is the author of a number of engineering articles.

Besides being a member of WSE, Edwards is a member of the American Society of Civil Engineers and is president of the Illinois Section. He also belongs to the American Society of Mechanical Engineers, and is a member and past president of the Chicago chapter of the Illinois Society of Professional Engineers.

The Stanley Engineering Company opened its Chicago office for the purpose of providing improved consulting engineering service to industrial and other clients in the Chicago area. The main office will remain in Muscatine, Iowa.

Fred G. Benner, AWSE, formerly an instrument man with C.M.St.P. & P. R.R. Co. is now an assistant engineer with the company.

Howard J. Pratt, MWSE, is now an inventory and costs engineer with Illinois Bell Telephone Co. He was formerly plant appraisals engineer.

The appointment of **Robert E. Zinn,** MWSE, as professor of chemical engineering at the Northwestern University Technological Institute has been announced by Payson S. Wild Jr., dean of faculties.

Zinn, who resides at 2015 Kenilworth, Wilmette, has been a professorial lecturer in chemical engineering at the Institute for the past two years. On joining the faculty in 1951, he terminated 24 years' employment with the Victor Chemical works, Chicago Heights, where he began as a junior chemical engineer in 1927 and rose to the position of chief engineer.

Zinn received his bachelor's degree in chemical engineering from the University of Wisconsin with honors in 1927. He is presently associated with the Vern E. Alden Co., engineers, of 33 N. LaSalle, Chicago, as a consulting chemical engineer.

A former national councilor of the American Chemical Society, Zinn is secretary of trustees and past chairman of that organization's Chicago section. He is past chairman of the Chicago section of the American Institute of Chemical Engineers and belongs to the American Society of Mechanical Engineers, the Western Society of Engineers, the National Association of Corrosion Engineers and Phi Mu Alpha, musical fraternity. A member of Alpha Chi Sigma, chemistry and chemical engineering fraternity, Zinn is a past president of that group's Chicago Professional chapter and is at present the faculty advisor for the Northwestern chapter.

Dr. Johan Bjorksten, MWSE, president of Bjorksten Research Laboratories announces that the Chicago office and laboratories moved from their former location at 13791 South Avenue "O" on July 1. The new address is 1525 East 53rd street, Chicago 15. Dr. Edwin L. Gustus, vice president, will continue to head the Chicago branch.

Bjorksten Research Laboratories maintains its headquarters in Madison, Wisconsin, where a new three-story laboratory and office building is currently under construction.

Hydraulic Research Group Meets

The Fifth Congress of the International Association for Hydraulic Research is being held jointly with the second meeting of the Hydraulics Division of the American Society of Civil Engineers in Minneapolis on the campus of the University of Minnesota from Aug. 31 to Sept. 4. This is the first meeting of the IAHR on the American continent. The Hydrology Section of the American Geophysical Union will also hold a regional meeting on the University campus.

The opening session of the Congress will be in the auditorium of the Museum of Natural History the morning of Sept. 1. Preparations for the Convention have been undertaken by local committees established by the Northwestern Section of the American Society of Civil Engineers with headquarters at the St. Anthony Falls Hydraulic Laboratory of the University of Minnesota. The technical proceedings for the meetings, including 49 comprehensive hydraulics papers, are being published and will be issued immediately preceding the Congress.

The theme of the Congress is encompassed by four symposiums toward which all technical papers are directed. Geophysical aspects of hydraulics make up the theme as follows: (a) Basic Relationships of Sediment Transportation by Flowing Water, (b) Density Currents, (c) Air Entrainment by Flowing Water, and (d) Waves, Beach Erosion, and Hydromechancis of Shore Structures.

The Hydraulics Congress will be in session from Sept. 1 to 4 inclusive. The regional hydrology meeting of the American Geophysical Union will be held on Aug. 31. Housing for the large attendance is being arranged on the campus of the University of Minnesota as well as in Minneapolis hotels. Social evenings are planned, such as an "Ice-Breaker" party Sept. 1 and a Congress banquet Sept. 2, while the evening of Sept. 3 is being arranged by the American Society of Civil Engineers, Hydraulics Division, as an open technical forum.

Instrument Society Sends 350,000 Bids

The Instrument Society of America has ordered and mailed out 350,000 invitations and Advance Programs announcing the Eighth National Instrument Conference and Exhibit to be held in the Morrison and Sherman Hotels in Chicago, September 21-25.

This gathering, sponsored by the Instrument Society of America, will include the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the Institute of Radio Engineers, and the Scientific Apparatus Makers Association. An attendance of over 15,000 is expected.

Speakers will include more than 100 outstanding scientists and technical specialists from government, educational, and industrial organizations. Few subjects will be untouched and the inside stories of many scientific projects will be told.

Industrial Instrumentation is largely responsible for making faster and in greater volume the things we must have for war or peace. It now guarantees the supply of the things we eat, wear, and use each day. It is scientifically and synthetically producing replacements for fast diminishing supplies of raw materials. Industrial Instrumentation assures high quality, speeds output, and reduces labor's toil while increasing its opportunities. It is conserving millions of tons of necessities which only a few years ago were wasted or lost. Instrumentation is making better things for more people, eliminating repetitive drudgery and making our world a better place to live in.

Present developments which exceed the imaginations of Jules Verne and H. G. Wells are commonplace. Research presently being conducted by an increasingly large group of scientists and technicians gives evidence that future practices in American industry will continue to set the pace for the rest of the world.

Dick Company Official Named Exposition Head

Dr. T. U. Marron, chemical research supervisor for the A. B. Dick Company, has been named chairman of the Eighth National Chemical Exposition by the Chicago Section of the American Chemical Society, it was announced July 13. He has been a member of the committees in charge of previous Expositions, acting as assistant chairman in 1952 and as registration chairman in 1950.

Dr. Marron's first action as chairman of the big chemical industry show was to announce that the dates of the next Exposition will be October 12-15, 1954, and that it will again be held in the Chicago Coliseum. Plans indicate that it will surpass last year's event, which attracted exhibitors from Canada, Belgium, Germany, and England, in addition to those from the United States, and for which all available exhibit space was taken. The 1952 Exposition was attended by more than 15,000 technical men from every state and 22 foreign countries; greater numbers are expected in 1954 because of the more favorable dates in October rather than in September.

The Exposition was inaugurated by the Chicago Section of the American Chemical Society in 1940, and has been increasingly successful in serving the chemical industry. It is the only exposition in this field operated by a technical society.

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E.M.C. Offers Booklet for Career Guidance

"The Engineering Manpower Commission *Newsletter* has contained information from time to time during the past six months about the cooperative program 'Engineers Wanted' of The Advertising Council and the Engineering Manpower Commission," T. A. Marshall, Jr., executive secretary, Engineering Manpower Commission of Engineers Joint Council reports. "The purpose of this program has been to interest industrial organizations in the active support of our engineering career guidance activity. Its primary working instrument is the booklet *How Your Company Can Help Promote Engineering as a Career* which is a guide to effective programs designed to interest talented young people in careers in engineering.

"Thus far about 500 companies have evidenced interest in this program," Marshall says. "Our judgment," Marshall continues, "is that while implementation of it has been satisfactory, it has not entirely measured up to expectations."

Marshall asks that the booklet and the suggestions it contains be brought to the attention of the companies in this area.

The Engineering Manpower Commission will be happy to provide as many additional copies of the booklet as required, he says, adding an expression of appreciation to the Western Society for the cooperation the Society has given.

Copies of the booklet may be obtained by writing T. A. Marshall, Jr., Executive Secretary, Engineering Manpower Commission of Engineers Joint Council, 29 West 39th Street, New York 18, N. Y.

Hirohito's Quarters Get Air Conditioning

Emperor Hirohito's living quarters in the Japanese Imperial Palace in Tokyo are to be air conditioned by the most modern American system, officials of Carrier Corporation announced.

Carrier executives said the firm had been awarded a contract to air condition 17 rooms of the palace. Before the war these rooms were used for the Emperor's private study and conference rooms, but the palace was practically destroyed during the war and they have now been converted to serve as the Emperor's private residence.

A year-round, duct type system will heat the emperor's quarters in winter and provide a constant flow of cooled, filtered and dehumidified air in summer. Much of the equipment for the system will be made in Japan under the direction of Carrier engineers, but the 30-horsepower compressor which is the heart of the air conditioner will be imported from the United States.

Carrier, oldest and largest manufacturers of air conditioning equipment in the world, also installed the air conditioning system in Tokyo's famed Imperial Hotel last year just across the street from the palace.

Computer Men Meet

One hundred and sixty-five of the Nation's leading authorities in the field of automatic digital computers (electronic brains) attended a symposium on "Advanced Engineering Techniques of Digital Computers" sponsored by Argonne National Laboratory on August 3-4-5, 1953.

The three-day symposium, sponsored by the Laboratory in cooperation with Oak Ridge National Laboratory, featured discussion on such topics as: ferromagnetic memory, application of transistors to high-speed computers, Williams tube memory, and special computing devices. Representatives of 25 industrial firms, 15 educational institutions, and 10 Government agencies attended.

Dr. Louis A. Turner, director of the Laboratory's Physics Division which sponsored the symposium, made the following statement concerning the purpose of the meeting: "It is hoped that this assessment of progress in the field of computers will lead to a wider and more profound appreciation of the new developments and contribute to the early realization of smaller, cooler, and still better automatic digital computers."

Manager of the conference was J. C. Chu, engineer in charge of the design and construction of Argonne's AVIDAC and the recently completed ORACLE, which is the fastest high-speed general-purpose computer ever built.

Inactive Men Affected but Slightly by Humidity

Inactive men are equally comfortable at either 30 or 80 percent relative humidity in temperatures ranging from 72 to 76 degrees Fahrenheit. Their skin temperatures are higher at 80 percent relative humidity than at 30 percent. Compared with women in similar environments, men have higher skin temperatures and greater heat losses by evaporation.

These are some of the observations of a research study made public at the Semi-Annual Meeting of The American Society of Heating and Ventilating Engineers in Denver.

This reseach, sponsored by the Society and the United States Public Health Service in cooperation with the University of Illinois, College of Medicine, was reported in a paper entitled, "Effect of Relative Humidity on Heat Loss of Men Exposed to Environments of 80, 76 and 72 Degrees Fahrenheit."

The paper stated that the object of the research was to re-examine the effects of environments with widely different relative humidities on the partition of heat loss of uniformly and lightly clad men and on their subjective sensations of thermal comfort.

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Reviews of Technical Books

Engineering Drawing

Engineering Drawing, by J. V. Lombardo, L. O. Johnson, and W. I. Short; Barnes & Noble, Inc., New York, N. Y. First Edition, 1953. 432 pages. $2.00.

This is a paper-bound book, printed on relatively small pages, which has the advantage of including a great deal of information at low cost. The authors confine themselves to the basic chapters used in the average college class.

This book is a new addition to the publishers' "College Outline Series." The "outline" idea is indicated in the very beginning by the "Tabulated Bibliography of Standard Textbooks," in which cross-references are given to the more comprehensive texts. Evidently the student is expected to use this "outline" book in conjunction with some standard text.

Although the book is much more than an outline, there appears to be little that is new or presented in a new way. In some cases, such as screw threads, the material is already out-of-date.

Engineering Mechanics

Engineering Mechanics, by L. E. Grinter; The MacMillan Company, New York, N. Y. First Edition, 1953. 408 pages. $5.75.

In this latest book by Professor Grinter, the author has attempted to humanize the science of mechanics as it were by analyzing many of its applications to problems with which the student has gained familiarity in his everyday experience. It is difficult indeed to find a single well known application of mechanical principles to our twentieth century civilization which is not described in this book. Extensions of a number of these examples form the basis for many of the problems in the text. One might well characterize the book by saying that it is an outstanding example of the philosophy of learning by doing rather than by theory since so much emphasis is placed on solving particular problems rather than acquiring an axiomatic understanding of this basic branch of physics.

The first half of the book is devoted entirely to statics, which is presented with a great deal of emphasis on structures. The text contains detailed analyses of many special examples which in conjunction with the problems are designed to cover every conceivable situation covered by the general theorems. The second half of the book treats dynamics in the same manner. The book covers the subject of mechanics quite thoroughly and it seems to be especially adapted to the needs of civil engineers.

K.E.B.

Engineering Drawing

Engineering Drawing, by Frank Zozzora, McGraw-Hill Book Co., Inc., New York 36, N. Y. First Edition, 1953. 369 pages. $5.00.

This new book differs from the other standard texts in this field chiefly in being limited to topics regularly covered in the average curriculum. Such subjects as architectural drawing, aircraft drawing, jig and fixture drawing, and so on, are omitted. The basic topics, therefore, are treated at some length.

The book is printed on 8½ by 11-inch pages, which provide ample space for the many illustrations. Orthographic projections are accompanied, in many cases, by pictorial drawings to help the reader to visualize the views. A unique feature is the liberal use of hands pointing, spanning, or otherwise helping to emphasize or clarify. In some cases this is overdone and detracts from the illustrations.

Gas Turbines

Gas Turbine Analysis and Practice, by Burgess H. Jennings and Willard L. Roger, McGraw-Hill Book Company, New York 18, N. Y. First Edition, 1953. 487 pages. $8.50.

This first edition is a survey of the gas turbine field in that it covers practically all of the topics necessary for one to be thoroughly acquainted with in order to be considered an authority in the field.

The authors start with the history of the subject and continue with a chapter on thermodynamics before proceeding to thermodynamic analyses of gas-turbine cycles. A table of air properties is included for use in solving the numerous problems at the end of the chapters.

Gas turbine types and design features are discussed. Axial flow, centrifugal and displacement compressors are considered. Chapter seven covers aircraft propulsion and jet engines and is followed by a chapter on power plant and transportation units.

Material is included on fuels, combustion and combustion chambers, stresses in turbine-plant elements, vibration and balancing and materials and metallurgy.

Since any one of the above topics is a subject complete in itself the treatment is not detailed but is presented from a broad coverage point of view.

The book is well written with many illustrations and problems. A bibliography of reference material is included in each chapter. This book may be used as a text or background for the practicing engineer who is interested in the gas-turbine field.

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Freshman Scholarships Given to Twenty People

Winners of 20 freshman scholarships to Illinois Institute of Technology in Chicago were announced August 4 by Philip B. Lottich, I. I. T. director of admissions.

Eighteen of the scholarship winners are Chicago-area students; one is from East Moline, Ill., and one from Alameda, Calif.

The Illinois Tech scholarships, valued at $650 a year, are awarded on the basis of a competitive examination, interviews, and recommendation of the applicant's high school principal.

The scholarship winners, the high schools they graduated from, and the courses of study they will take up when they enter I. I. T. this month are as follows:

James M. Brown, Bowen high school, chemical engineering; Harold G. Carlson, United Township high school, East Moline, Ill., chemical engineering; Sidney R. Coleman, Senn high school, physics; Shirley L. Courtois, Immaculata high school, design; Isabel Donzis, Roosevelt high school, home economics; Claudia D. Fritzler, Alameda (Calif.) high school, chemistry; Sidney L. Gordon, Senn high school, mechanical engineering.

Edward J. Kaiser, St. George high school, Evanston, architecture; Edward C. Kokkelenberg, DePaul academy, chemical engineering; Raymond J. Konieczny, St. Mel high school, physics; Donald R. Marsch, Leo high school, chemical engineering; Norma Missner, Roosevelt high school, chemistry; Benjamin A. Okner, Hyde Park high school, industrial engineering; Donald J. Patrick, DePaul academy, mechanical engineering.

Richard E. Paulsen, Oak Park high school, chemical engineering; Thomas E. Pawlak, Morton high school, Cicero, civil engineering; Daniel A. Ruskin, Senn high school, chemical engineering; Harold A. Schroeder, Luther institute, chemistry; Geraldine R. Voelker, Kelvyn Park high school, biology; and David A. Worcester, Proviso high school, mechanical engineering.

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OVER THE MANAGER'S DESK

September normally means the end of the vacation periods with the desire to get back to work. In order to make up for time lost during the summer months and as a result it should be the beginning period to put emphasis towards completing the projects started in the spring. Why not let E.S.P.S. help you find the man to complete your projects or let us help you find THAT position which will make you feel as an individual that you have made progress in completing some of the major projects of your career? B. H.A.

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D-8710 RESEARCH METALLURGIST —Age: open. With several yrs. responsible supervisory exp. in development of machinery parts by the powder metallurgical process. Knowl. of automotive requirements helpful. Sal: $15,000-$18,-000. Location: Midwest.

D-8711 PRESIDENT—ME Degree or equiv. Age: 50-55. For a company operating 6 metal stamping plants. Must have 20 yrs. ex. in mass-production industry, pref. in fabrication of light metal & mech. rubber products for automotive mfgrs. Min. 5 yrs. in top management responsible for organization, coordination and direction of mfg. sales, product devel., engrg., financial and management control operations. Sal: $40,000 to $50,000. Loc: Midwest.

C-1185(F) MECHANICAL ENGINEER —Power Desire grad. M. E. approx. 30-45 yrs. of age. Duties: involve supervision of 125 to 130 hourly employees. Equipment consists of boilders up to 200,000 lbs. per hour. turbo generators, pumps and air compressors. Sal: $500-650. Location: Ohio.

C-1187 DEVELOPMENT ENGINEER —Some college engrg. Age: 22-60. Knowledge of engineering. Duties: develop and supervise construction of new equipment and methods in products. Increase efficiency in present machines and products. For a manufacturer of train tile. Salary: $400-600 dep. on applicant. Employer will negotiate fee. Loc: Illinois.

C-1189 CHIEF MFG. ENGR.—ME Age: 32-38. 5 plus yrs. exp. in mfgs. small precision products. Knowledge of production equipment. Duties: responsibility for complete industrial engineering program and tooling activities. For a manufacturer of precision parts. Salary: $8000 per yr. Employer will negotiate fee. Location: Chicago.

C-1190 PRODUCTION MANAGER— Grad. Chem. or Chem. Eng. 2 plus yrs. exp in process industry foods or drugs. Duties: charge of all production for plant of 15 employees manufacturing drugs. Sal: $450 Plus. Loc: Chicago.

C-1192(a) WELDING ENGINEER— Age: up to 55. Extensive knowledge of spot & resistance welding on sheet metal. Duties: processing & determining most economical methods in welded assemblies on sheet metal, some stainless steel & some other metals. For manufacturer of major appliances. Salary: $500-700 per month. Loc: Chicago.

C-1193 STRUCTURAL ENGINEER— Grad. C. E. or Struct. 5 plus yrs. in timber structures design exp. Duties: Must have structural engineer's license. Duties: in charge of engineering and promotional work in Chicago office. Good personality—call on arch., engrg., etc. promoting uses of timber. Salary: $400-600. Employer might negotiate fee. Loc: Chicago.

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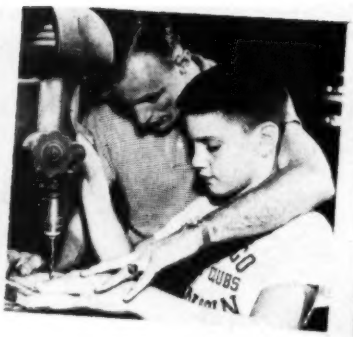

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